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Address.

TUBERCULAR INFECTION IN INFANCY AND CHILDHOOD.*

BY VANDERPOEL ADRIANCE, M.D., WILLIAMSTOWN, MASS.

IN the bulletin of the Massachusetts Trustees of Hospitals for Consumption, December, 1913, it was stated: "The importance of childhood infection is coming to be recognized as a most important factor in anti-tuberculosis work. The Board wishes to impress upon physicians and anti-tuberculosis workers throughout the State the absolute necessity of recognizing and treating tuberculous infection in children if we are ever going to make any headway against the disease. There is too much of a tendency to wait until people become sick before we cure them. The bulk of patients at present under treatment in our sanitaria represents the results of infection when they were children."

On August 1, 1914, the same Trustees sent to each physician of the Commonwealth a letter which said:

"It is your opportunity, first, to protect these children from infection, and second, to see that they are cared for when such infection has taken place. If you delay making a diagnosis until actual disease is evident, the case has probably gone beyond the stage when cure is possible. A diagnosis of 'infection', as contrasted with a diagnosis of 'disease' is the key to this problem."

* Read at a meeting of the Berkshire District Medical Society.

Under such instructions it behooves us to try to understand the situation as accurately as possible, and it is in order to bring new facts to your attention that I am glad to bring certain statements before you which have been forced upon my attention in the course of recent reading.

Von Behring says, "Tuberculosis in the adult is the result of a song begun in the cradle of the infant," and Biggs[1] states, "The conviction has gradually been strengthened that the first infections from tuberculosis occur during infancy and childhood, and extreme care is required if this is to be avoided in tuberculous families."

It is important for us to do away with the old idea that tuberculosis is inherited, for the experience of pathologists seems to prove that tubercular lesions are extremely rare in the new born. It is no wonder that C. J. Grulee[2] considers a congenital case so unusual as to be worthy of reporting. Tuberculosis is also rare during the first weeks of life, but gradually increases. It is during childhood that the greatest amount of tuberculosis is contracted, however, and people interested in human tuberculosis cannot help being interested in the experiments[3] with cattle at Woodcrest, reported by Harlow Brooks, which show that tubercular cows and bulls can be safely used for breeding, providing the offspring are removed from their infected progenitors and the calves taken away from them directly after birth. In this way many valuable cows which are tubercular may be safely used to perpetuate desirable traits, and great loss, the result of their slaughtering, is obviated. The offspring, however, should be very strictly quar-

antined. This reasoning can be applied to children, for if calves can be saved from infection, it is possible to protect the children of infected parents. Accumulated evidence shows that childhood infection is only the beginning of an adult tuberculosis, and if the children are protected, adult tuberculosis will diminish. This theory rests upon the supposition of a latent tubercle, a view which has lain dormant since it was advocated by Weigert, Harbitz and Patruschky, who wrote upon this subject ten years or more ago, stating that all cases of pulmonary tuberculosis occurring in adult life represent infections in the household in early life.

In order to understand much of the recent progress in our knowledge of tuberculosis the importance of von Pirquet's reaction must be realized. It has changed many of the old ideas and been the basis of many investigations which now flood medical literature; and in order that the physicians of the Commonwealth might better understand the practical application of this reaction, the Trustees informed us a year ago that they wished the profession to know of its practical workings, and offered opportunity at convenient places throughout Massachusetts where the profession might be instructed. The use of the test has modified our views of tuberculosis in childhood. It determines the infection of the patient. Although the infection is suspected, it is definitely proved by the test. It is the appeal of the State Board of Health that the children be protected even against infection, but when infected and proven so by the test, that they be protected against the actual development of the disease. The von Pirquet or tuberculin test is more delicate than a macroscopical examination of the body after death, for it proves an infection even when there are no gross lesions. It tells us when people are infected, although they may appear perfectly healthy and may be passed as healthy by the most searching physical examination. On the other hand, the presence of the test occurs in all stages of the disease. It may be present with a mild infection, with a small area of localized tuberculosis, with an acute general miliary tuberculosis, or it may be present in the final stages of chronic tuberculosis. The only thing that a positive von Pirquet reaction proves is that there is an infection with tubercle bacilli. On the other hand, when the test is positive, it is not necessary to be pessimistic, for it does not necessarily mean disease.

There is one thing which studies with the von Pirquet reaction have drawn to our attention, namely, that the great mass of tubercular people are infected in the family. Family infection plays a great part in the spread of the disease. A large proportion of infections in individuals are present as the result of infection from one individual to another, and this usually occurs from the old to the young. Infection beginning in adult life is not nearly so much to be dreaded as infection in the infant, and when we accept this we shall come much nearer to the solution of the anti-tuberculosis problem. When there is an adult with tuberculosis the children of the family should be carefully examined. McCorison[4] emphasized the rôle of family clusters in an address at a recent meeting of the Massachusetts Anti-tuberculosis League. Among the patients which were admitted to the North Reading Sanitarium he found 134 distinct families in which at least three cases of pulmonary tuberculosis occurred. In studying the records of one-tenth of the admissions to the Sanitarium it was proven that a group of at least three consumptives was found clustered about the one who was sent away for treatment. As the result of a study of the spread of tuberculosis in families, by Herbert Lampson[5] of the University of Minnesota, the author concludes, first, that the spread of tuberculosis in families where open cases of tuberculosis exist is greater than it is generally understood to be. Sixty-seven per cent. of the individuals of the families investigated, excluding the center cases, showed evidence of tuberculous infection. In no case where there has been definite proven exposure of a family to an open case of tuberculosis has he failed to find a spread of the infection. In at least ten cases investigated the infection had spread to the limit of available material. Every member of these ten families showed evidence of tubercular infection. On the other hand, he concludes, "When no tuberculosis is found in a family the number of individuals showing evidence of infection is very small." Lampson's report is based largely upon the use of the von Pirquet test, and by its use other interesting results have been obtained, as those of Morris Fishberg,[6] who reports a study of all the children of the tuberculous applying for relief at the United Hebrew Charities of New York during a three months' interval. He reports, of 692 children, 67¼% gave a positive von Pirquet; the proportion of positive reactions during the first year was 15%; two years, 55%, steadily increasing to 74½% during the period from the 11th to the 14th year.

Vedder and Johnson[7] summarize as follows: "A study of tuberculin tests in 1321 hospital children in St. Louis shows that the percentage of positive reactions reaches a maximum of 44% at the age period of 10 to 14 years."

The experience of Pollock[8] shows that 96% of the children in Vienna were infected before the 15th year, while Hamburger[9] states that 95% of the children in Vienna are infected.

Calmette[10] found during the first year while only 9% were infected, that the percentage kept increasing until it was over 87% at 15 years. Reports from other large European cities show similar results.

Manning[11] of Seattle wrote as follows: "I made a careful clinical study of 228 children

coming to the tuberculosis division of the Seattle Health Department in relation to tubercular surroundings. Of 166 children with definitely known exposure to tuberculosis, 50.6% reacted positively to the von Pirquet test; 49.3% reacted negatively to the same test. Of the 62 children examined with a history of no known exposure, 22.8% reacted positively and 77.4% reacted negatively. Between 10 and 15 years there was the largest number of reactors, 58.1%."

Hillenberg[12] studied a prosperous agricultural community in Germany where no open cases of tuberculosis had been observed for years, yet he found one-fourth of the children between 6 and 14 years showed infection.

You will notice that Manning's results, as well as Vedder and Johnson's, are lower than those of foreign observers. But it is apparent, after studying American and foreign figures, that the proportion of infections increases from year to year till it must be admitted, even in our own country, by the time children reach 15 years of age half of their number have been infected, and most of these from some individual in their own family and not from outside sources. We must frankly admit our ignorance of the number of children infected in small towns, but admit by analogy the fact that there is a gradual increase of the number affected up to 15 years of age. On the other hand, as the number of the infected increases with age, the mortality diminishes. That is to say, the older the child, the better his chances when once infected. Thus Hamburger[9] would have us believe that while 80% of children infected before one year of age die, only 10 to 20% infected after two years die. LaPage,[13] from postmortem evidence, states that the mortality rises during the first year, reaches its maximum in the second year, and then falls rapidly.

Rogers[14] says, "Before the age of two a positive skin reaction seems to be an indication that the child's life is likely to be short."

Wallstein and Bartlett,[15] after careful study of 1320 autopsies at the Babies' Hospital of New York, state that of the 178 tubercular lesions found, 75% were in subjects under two years of age and only 25% in the older children."

Morse[16] says a very small proportion of the children responding to the von Pirquet reaction, however, have tubercular disease. Those who are well and show no symptoms of tubercular disease are little, if any, worse off than those who have not been infected. In fact, it is probable that in many, if not most instances, they are better off in that they have established a certain immunity to tuberculosis.

Baldwin's[17] ideas have a broader viewpoint than the outlook for one generation. He believes that in the ultimate survival of those who acquire a relative immunity there will be a tendency to diminish the severity of the disease. By inherited immunity the disease will be combated and reduced in virulence, so that after many generations its severity will be reduced. He believes that the opportunity for infection will react to the benefit of the human race by establishing a gradual immunity.

Fishberg[6] claims that by this method the Jewish race, which pays a very small toll to tuberculosis, has acquired a larger degree of immunity.

Authorities of today believe that the majority of tuberculosis begins in childhood, and the greatest hope for its extermination lies in the prevention of infection in childhood. This means that children must be guarded against infected members of the home circle and forces attention upon the sociological conditions of the child's life.

Where it can be carried out, as in tuberculosis dispensaries, careful examinations and von Pirquet tests of all children in tuberculous families must be a part of the routine practice, and when children are in the pretuberculous or tuberculous state they should have the benefit of out-of-door life, general hygienic or sanitarium treatment.

Hess[18] would have New York erect preventoria, where the children of tubercular parents could be kept free from the poison of the home life. Yearly physical examinations of all public school children are now customary, and one of the great results is the early discovery of the tubercular or pretubercular state. The principal difficulty is that with our present equipment the diagnosis may be made quite early, but we have not the machinery for treatment. The proper management of such cases at home, when sociological conditions are unfavorable, is indeed difficult and the tendency is to erect institutions to meet the conditions. Open-air schools sanitaria and preventoria at present seem to be on the increase as a partial solution to the problem, and it is interesting to note that in New York there is a so-called Home Hospital, where a family in which a case of tuberculosis exists is moved to live under bettered conditions, in the hope of preventing the infection of the rest of the family, particularly the children.

It would be unwise to lay too much stress upon bovine tuberculosis when we are just beginning to comprehend the disease in human beings, but we cannot discuss the occurrence of tuberculosis in infancy and childhood without acknowledging a relationship between the two. While the great proportion of infection results from exposure to human cases, we must acknowledge that a certain number of cases originate from tuberculous cattle. It is hoped, however, that any attention drawn to this source of infection will not divert attention from the much larger and more important subject of human infection.

It is generally agreed that, whereas there is a certain relationship between the number of

people infected with bovine and human tuberculosis this appears to vary with age.

The greatest number infected with the bovine variety occur in infancy and childhood and do not increase with age, but this is not the case with the human type, which increasingly manifests itself in adult life.

If we concede that tuberculous infection takes place mostly in childhood, bovine infection assumes a new importance, and the warning of the Massachusetts Board of Health that milk from tuberculous cows is extremely dangerous for young children deserves greater attention.

The Massachusetts Board of Health says in its circular to our profession, "Furthermore, remember that milk from the cows is extremely dangerous for young children, and urge your patients to pasteurize their milk."

Many of us will have a prejudice against pasteurizing milk unless we know it is necessary. But a review of the literature on the presence of tuberculosis in cattle will convince anybody that the danger is a real one.

The United States Bureau of Animal Industry estimates that at least 20 to 30% of the dairy cows in our country are affected with tuberculosis, and I imagine these figures are not far out of the way for our own region.

The results of individual investigators, as well as the British Royal Commission on Tuberculosis and of the German Commission, show that, whereas pulmonary tuberculosis is practically always human in type, there is a considerable percentage of bone, joint, abdominal and lymph gland tuberculosis which is bovine in origin. Park and Krumweide[19] of the New York Board of Health, after collating the results of foreign and American investigation, declare a very high percentage of abdominal tuberculosis and cervical lymphadenitis is due to the bovine bacillus. The percentage of children infected varies according to different observers, but Orth says 10% of all tuberculosis in children is due to bovine infection.

An English observer[20] says "not less than 25% of the tuberculous children under five years of age suffer from an infection of bovine origin," while Rosenau[21] states "one-fifth to one-fourth of all cases of tuberculosis in infants and children are associated with the bovine bacillus."

In Park and Krumweide's series of 1511 cases of human and bovine infection, 12.5% of the fatal cases under five years were bovine. The cases show a high percentage of abdominal tuberculosis and tubercular cervical lymphadenitis due to the bovine bacillus.

The occurrence of the bovine type has been most easily and advantageously studied in infected cervical glands.

Mitchell[22] of Edinburgh, after studying 72 such cases, found 65 cases yielding bovine and only 7 yielding the human type. Eighty-eight per cent. of the children 2 years and under had been fed on unsterilized cow's milk. Fraser, in the same city, in 100 cases of bone tuberculosis found 62% bovine and 35% human, while 3% yielded both types.

Melcher[23] studied the method of infection in 80 consecutive cases of tubercular cervical lymphadenitis, and found 88% bovine in origin, 12% human in origin. All of these children were under 12 years of age and 84% of those under 2 years of age had been fed on raw cow's milk. He concludes that the infection came from the cow's milk.

A. Stanley Griffith,[24] in a study of cervical gland tuberculosis, showed that the proportion of bovine infections was greatest in children under five years of age, namely, that 90% of such infections occurred under that age.

A. Philip Mitchell,[25] having previously studied the frequency of bovine tuberculosis in glandular tuberculosis in the children of Edinburgh, reported that on the bacteriological examination of 406 samples of milk collected from as many shops there were 82, or 20%, found to contain the tubercle bacilli.

In the present state of our knowledge, we are apt to think of two distinct types of tubercular germs, and yet that they have a certain relationship cannot be doubted. Their actions are similar and their biochemistry is certainly very similar. The two varieties have been found in the same individual. Tuberculin made from the two varieties seems much the same. It is perfectly comprehensible, and in fact a matter of every-day experience, that tuberculin cures certain cases of tuberculosis in human beings which are caused by the human type of germ. It seems equally comprehensible that a bovine tuberculin may cure lesions in man or beast caused by the bovine type. In both these lines experience will teach many practical points, and we shall all be interested as progress is reported. The value of the tuberculin of one variety in its action upon the lesions of another is only suggested by recent literature. At the Tenth Annual Meeting of the National Association for the Study and Prevention of Tuberculosis, Dr. Gililand[26] reported that he had treated cows with a vaccine prepared from human tubercle. (The work was conducted at the Experimntal Farm of the Pennsylvania State Live Stock Sanitary Board.) The injections were given at varying intervals and in varying amounts. The vaccinated cows were exposed to infection by close association with badly diseased cows. When vaccination had been properly done the cows were apparently rendered immune but the unvaccinated cows died or developed large lesions. Dr. Gililand particularly calls to our attention the fact that it was the injection of the human type of germ which gave immunity to this group of cows, and believes that the experiments suggest a hopeful outlook, but does not prescribe any practical method of immuniz-

ing cows which can be advocated for ordinary use.

W. L. Moss of Baltimore[27] attempted to immunize calves against tuberculosis. Six calves of approximately the same age, weight and breed were selected from healthy, non-vaccinated cows. Three of these calves were fed from birth with the fresh mixed milk of several vaccinated cows. The three remaining calves were fed during the same period with an equal amount of fresh mixed milk from non-vaccinated cows, proved by the tuberculin test to be free from tuberculosis. At the end of several months all six calves were inoculated with a medium dose of bovine tubercle bacilli. The feeding of all calves was continued as previously until the termination of the experiment. At the conclusion of the experiment a necropsy was performed on one calf from each group and the lesions present compared. The calf which had received milk from immunized cows showed a small lesion at the site of inoculation, about 2 cm. in diameter, containing caseous material and surrounded by a thick fibrous wall. The related axillary lymph glands showed small caseous nodules and there were a few caseous areas in the bronchial lymph glands. The control animal showed at the site of inoculation a caseous abscess, 6 to 8 cm. in diameter, with a thin wall. The related axillary lymph glands were enlarged and caseous, as were also the bronchial lymph glands and those in the region of the gall-bladder. The liver contained from 15 to 20 caseous areas 1 to 5 cm. in diameter. The result of the experiment seems to justify the conclusion that a relative degree of immunity against tuberculosis may be conferred on calves by feeding the milk of vaccinated cows.

Clive Riviere[28] raises an interesting point. Assuming that the bovine type is less virulent than the human, he questions whether it is not doing useful work in protecting against the more virulent human type. He doubts whether we should not take measures to secure a mild bovine infection in the way of establishing a gradual immunity rather than leave our children to risk a first encounter with the infinitely more virulent human organism.

L. Sivori[29] reports that experiments on immunized cows show that antigens and antibodies are found in the milk, though not in such quantities as in the blood, and, furthermore, that animals born of non-immunized mothers show antitoxins and agglutinins in their serum, thus proving absorption of such bodies through the gastro-intestinal canal. He would have us believe that the protective substances in milk immunize against tuberculosis.

Julius Rosenberg[30] believes so thoroughly in the value of immunized milk that he glorifies its use, and feels so confident of its usefulness that he has supplied it free of charge to a number of physicians and hospitals. Some institutions have been supplied with the milk for five months, and at the time of his writing he had 60 cases to report in which there was positive proof of the value of immunized milk as a remedy in tuberculosis of every type and degree.

If cows immunized against the bovine variety of germ can furnish an antitoxin in the milk which is at all efficacious against the human variety, another link in the chain which unites the two organisms is established. This is only one of the relationships which are being discovered under the searching eye of modern scientific methods.

After having drawn your attention to the prevalence of bovine tuberculosis let us approach it from the standpoint of research by Briscoe and McNeal,[31] based on studies of the herds of the Illinois Agricultural Experiment Station. They conclude:

"The results indicate that well-nourished cows which react to the tuberculin test but otherwise appear normal do not commonly pass tubercle bacilli in their milk. Furthermore, under good conditions of dairy management tubercle bacilli are not likely to be found in the milk of such cows when it leaves the dairy. A certain number of such animals, however, in spite of their healthy appearance, are passing virulent tubercle bacilli from their bodies and are, therefore, a constant menace to everything in their environment. So far as we know there is no practical means of distinguishing between these dangerously tuberculous cattle and those which merely react to the tuberculin test, but are not excreting the bacilli."

There appear to be two ways to avoid the use of milk containing tubercle bacilli. The first is the best in theory but impossible in practice. It would seem a very proper procedure to kill all animals that are proven tubercular by the tuberculin reaction, but from the standpoint of the farmer as well as from an economic viewpoint this is impossible of execution. The popular voice would never tolerate the destruction of capital necessary to such wholesale slaughter. The voice of science would also say that the tuberculin reaction is too uncertain to be a rational guide in such a procedure. Nobody in the present state of our knowledge would venture to diagnosticate all the cows infected or all the cows diseased, and for a long time makeshifts must be adopted.

The tuberculin test is of use in certain private herds and selected dairies, and some people demand a certified milk from such dairies. This is only one step which shows that the people are gradually being educated to the desirability of a clean milk, but it does not prove that it can ever be carried out on a wholesale scale. Doing away with all the tubercular cows seems an utter impossibility, and we can never hope to see the day when the milk of tubercular cows is not offered to the public.

A more practical method is offered in pasteurization. The Massachusetts Board of

Health urges that this be commonly adopted, and in many of our dairies it is already in practical use. It is not an expensive method and it does away with many dangerous germs besides the tubercle bacilli. It is a good hygienic measure, which demands its general acceptance by the farmers as well as the endorsement of the medical profession.

SUMMARY.

1. A positive von Pirquet reaction is a proof of tubercular infection.
2. Tuberculosis in the adult is the result of a song begun in the cradle.
3. Tuberculosis is largely contracted in the home circle.
4. The number of children infected increases with the years of age.
5. A von Pirquet reaction during the first two years of life signifies a bad prognosis, but the mortality decreases as the years advance.
6. Infection with small doses of the germs at infrequent intervals may gradually establish immunity.
7. Infection with the bovine type of tuberculosis occurs mostly in infancy and childhood, while the human type is chiefly manifested in adult life.
8. The bovine type manifests itself chiefly in disease of the bones and lymph glands of the neck and mesentery.
9. There is a possibility that the milk of immunized cows may be useful in the prevention and treatment of tuberculosis in the human.
10. Pasteurization of milk should be generally adopted.

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Original Articles.

FRACTURES OF THE LOWER END OF THE HUMERUS.

BY W. E. LADD, M.D., F.A.C.S., BOSTON.

FRACTURES of the lower end of the humerus occur with much greater frequency in young patients than in adults. The treatment of these cases at the Children's Hospital has for some years past been fairly uniform. The majority of such cases have been put up in the position of acute flexion termed by Ashurst "hyperflexion." In general, reduction has been accomplished by manipulation only. In a small number, open operation has been resorted to, or a special variation in the position of immobilization, as indicated by the direction of the displacement of the fragments. For restoration of function, massage and passive motion have not been employed, but active motion has been relied upon entirely.

Upon such a general outline of treatment it has been interesting to compare the results secured here with those reported by other surgeons. For this purpose the routine records of the hospital have been studied, and in forty-five cases in which the records were complete and the skiagrams satisfactory, end-results have been secured.

For general consideration these cases have been broadly grouped as fractures of the internal condyle, fractures of the external condyle, and supracondylar fractures. Fractures which pass directly across the two condyles, termed diacondylar by many surgeons, have been classed with the supracondylar fractures. The principles of treatment in the two groups do not vary, nor is this fine anatomical distinction necessary for the interpretation of end-results.

In order to compare the end-results, standard terms of recovery must be adopted. A perfect result, as defined by Ashurst, Neuhof and Wolf, and others, is one in which the full range of motion is preserved and the carrying angle is normal.

An analysis of the work of a few representative surgeons seems more adequate for representing differing surgical points of view than a generalized summary of the entire subject.

The recent work of Neuhof and Wolf, advocating the value of early mobilization and massage, has been carefully gone over with reference to the type of fracture, the method of reduction, and the period of immobilization, as well as the after treatment recommended. The methods they advise are not in accord with either experience or practice here. Within my own observation, cases have occurred in which the size of the callus had been increased and the amount of motion limited by early passive motion and massage.

The practical difficulty to parent and child in

reporting daily for treatment is so great that it must be shown not only that good results can be secured by early mobilization, but that similar results are not secured without it.

The Neuhof and Wolf cases do not appear to me to establish the value of early mobilization and massage, and there is no small amount of intrinsic evidence in the study of their unsuccessful cases that callus is at times increased by the treatment. Their successful cases seemed to be the result of proper reduction and immobilization in the Jones' position, rather than the result of after treatment. To prove their contention, they should present cases put up in acute flexion after proper reduction, not having early massage and passive motion, and giving poor results. This they fail to do, and I have failed to find that such is the case from a fairly careful review of the literature, or from our experience. The high proportion of failure in their cases as a whole, 53%, may be ascribed partly to the fact that many cases were referred late after having been improperly reduced, or immobilized, by other surgeons, and possibly to unusually great deformity. The fact remains, however, that a comparison of the perfect and imperfect results shows that the imperfect cases equal or exceed the perfect cases upon mobilization and massage treatment in all groups except the one in which, in addition to the advantage of the Jones' position of hyperflexion, the cases presented in general slight displacements, generally posterior. One is unable to escape the conviction in the modern treatment of elbow fracture in children, that the imperfect results ought not to exceed the perfect results in any group which receives proper treatment, except that limited group which comes to operation for the correction of already established extreme limitations of movement.

Ashurst, in a comprehensive monograph published in 1910, points out reasons for the frequency of elbow fractures in children. That the age of the patient may be a factor determining other points than occurrence, is not emphasized. That the age is related to an early perfect result is at least suggested in our cases, and it is reasonable to suppose that the degree to which ossification in the bone has progressed, and the growth rate at which calcification is occurring, have a bearing upon the rapidity of repair as well as upon the ease with which fractures are mechanically produced. Treves in his work shows also that time through growth is to be counted upon to improve the immediate result, even where the reduction is imperfect, which finding is substantiated by some of the cases here.

With growth, slight bony prominences from unreduced displacements, or callus, may be removed sufficiently to allow free joint action. The time which elapses before a perfect result is reached is difficult to state, as patients generally fail to report further when a fairly satisfactory result is reached, and the final perfect result in the majority of cases is seen when the surgeon makes a special examination for the purpose of gathering data.

Ashurst's paper is singular in the report of but one operative case. In the work here we have found that the cases which have proved irreducible by manipulation only, for which we have come to adopt open reduction, are typical in the degree or direction of displacement initially presented in the fracture. Among Ashurst's cases, the two imperfect results in diacondylar fractures, and the one imperfect result in fractures of the external condyle, suggest in the data offered that operative treatment would have been followed here. Two of these, Cases 23 and 33, involved apparently marked displacement of the external condyle; the third, Case 24, a diacondylar fracture with rotated anterior displacement into the joint, shows evident imperfect reduction in the last skiagram after hyperflexion. This belongs in the group for which an internal angular splint, or open reduction, has been found essential here. The results secured by Ashurst by hyperflexion, though not perfect, are excellent under the conditions involved, and the claim is not advanced that better results would have been secured in the clinic here.

In the French literature, the work which has proved most interesting for a special examination of the cases is the monograph of A. Treves, published in 1911, which includes reports of some cases of Mouchet, Kirmisson, and Broca.

Treves' monograph was undertaken primarily from the point of view that late results (*resultats éloignées*) of elbow fractures in children were probably more successful than the immediate results, and that limitations of motion to a certain extent gradually disappear, and that the use of passive motion and massage is disastrous to hasten processes which even under conditions of imperfect reduction ameliorate themselves with growth and natural use.

The report reviews 79 supracondylar fractures with 68 perfect results; 42 external condyle fractures with 34 perfect results; 34 internal condyle fractures with 22 perfect results; a total of 155 cases with 88% of perfect results. The cases show a systematic roentgenological study from the first x-ray for displacement to the final skiagram of end-result. The determination of a perfect end-result differs slightly from the one adopted by American writers. A result is classed as perfect where the range of motion is practically complete and the variation in the carrying angle is not sufficient to be a noticeable deformity. A decrease in range of motion, or a positional deflection, therefore, which requires special examination for its detection, is treated as negligible, which for all practical purposes is correct.

The treatment in the French cases in many ways coincides with ours. Treves and his colleagues advocate reduction and immobilization in acute flexion in the majority of cases, never

PLATE I.—Supracondylar fracture with rotation, lower fragment.

PLATE II.—Lateral view of same case as Plate I three weeks after open reduction, showing good position and callus.

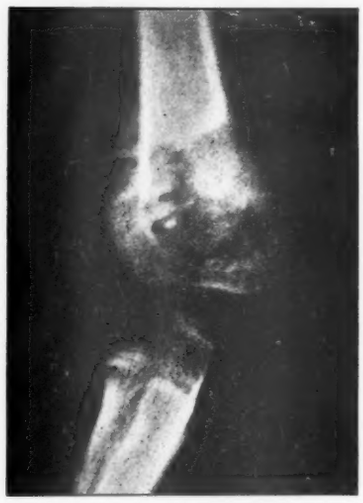

PLATE III.—Same as Plate II only antero-posterior view.

PLATE IV.—Supracondylar fracture with marked inward and backward displacement. Reduced by open operation.

PLATE V.—End-result of same case as shown in Plate IV one year later.

PLATE VI.—Supracondylar fracture with anterior displacement. The exceptional case for which acute flexion is obviously not applicable.

PLATE VII.—Same case as Plate VI, showing a satisfactory alignment obtained with an internal angular splint.

PLATE VIII.—Fracture of external condyle with rotation of the fragment.

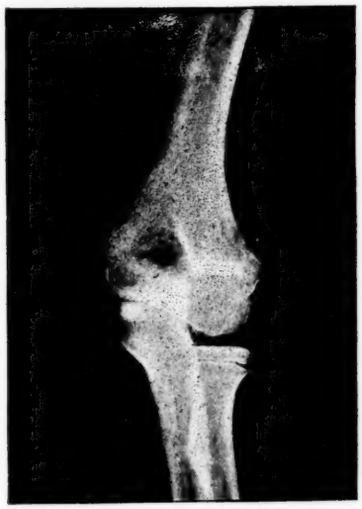

PLATE IX.—End result of case shown in Plate VIII after reduction by open operation.

use massage and passive motion, believing it to be never valuable and frequently harmful. His belief as to operative interference we should usually agree with as regards the type of case, but not as to the time operation should be performed, when necessary.

Personally, Treves does not advise operation except as a last resort from six months to a year after the original lesion, when faulty union has definitely occurred, or in special cases when a nerve is involved. The operated cases given, however, show excellent results from the point of view of improvement, but retain some persistent limitation very generally.

Broca, Mouchet, Destot, Vignard and Barlatier advise operative treatment in external condyle fractures where displacement is markedly forward or rotation of the fragment occurs, which agrees with our practice here. Kirmisson and Treves do not agree to this as an immediate resort.

Concerning fractures of the internal condyle, he reports "absolute restoration is more frequent than in any other group," which coincides with our limited experience in this type of fracture here.

From a critical point of view, the following cases from the surgical clinic of the Children's Hospital, and my own practice, have been studied and are presented.

There are 25 cases of supracondylar fractures with 21 perfect results, one of six months' duration, still improving, but with a remaining present limitation of five degrees in flexion, which experience indicates can be added to the perfect results; one operative case involving an ischemic contracture, duration one year, still improving, with a present limitation in extension of 15 degrees. This case at present remains uncertain in its final result, and has been excluded from percentage computations until it can be classed in one group or the other. There are two imperfect results. A total of 84% perfect results have been secured, with a probability that 92% of the cases will be eventually perfect.

An examination of these cases shows that all cases of slight displacement or no displacement gave perfect results: that the four cases operated upon by the writer because the displacement was irreducible by manipulation have given perfect results except for a very slight valgus deflection of the carrying angle in two cases, so slight that I feel quite satisfied to consider the arm perfect. These four cases presented the most serious types of supracondylar displacement.

The two imperfect cases involved special conditions. F. McW., entered the hospital six months after the original fracture for the operative correction of established deformity. A marked cubitus varus existed and a range of motion reported as between 1/3 and 1/4 of the normal movement. A wedge-shaped piece of bone was resected to lift the external condyle and free the obstruction of the coronoid fossa. I have recently examined this case,

eight years after operation. It shows excellent improvement upon the original condition. There is a valgus of five degrees and a limitation in flexion of 10 degrees. (Surgeon, Dr. Burrell).

The second case, E. R., came in with a fracture of the radius and ulna as well as the supracondylar elbow fracture, and with very marked swelling of the arm. Acute flexion could not be used immediately. The correction of the wrist fracture is perfect, and the only loss of motion is 15 degrees in flexion. It is two years since the reduction, and it is possible that the flexion may improve slightly with growth.

A study of the displacement in the group shows it to have been serious, or to have presented special difficulty in 16 out of 24 cases (F. McW. omitted), or in 66.6%, and that in the cases of serious displacement it was possible to reduce three out of every four practically without operation. While acute flexion was used in the majority of cases, an internal angular splint was applied under special conditions in two cases with perfect success. (See X-ray Plates VI and VII.) After reduction, the period of immobilization was determined independently in each case, depending upon the judgment of the surgeon in charge. There is no case in which the period was under three weeks, and none in which passive motion or massage was used.

The cases of external condyle fracture were 16 in all, in 15 of which, or a little more than 93%, perfect results were secured. Of these cases, 6 presented practically no displacement, and 2 very slight displacements. The remaining 8 presented difficulties in reduction, and in 5 of this number the displacement was considered irreducible and open operation was resorted to.

The one unsuccessful case in the series, F. J. C., entered the hospital four months after the original fracture with deformity of the arm and extension limited to 45 degrees. Operation was recommended and was not accepted until ten months later (14 months after fracture). A marked improvement was secured. The arm is limited 20 degrees in extension and has a slightly increased carrying angle and some atrophy of the hand and forearm. This case presented in its initial condition the displacement for which we recommend immediate operation, and was identical with the other four operated cases in all facts except the postponement of operation until long after faulty union had occurred.

The proportion of operated cases is higher in the group of fractures of the external condyle than in any other group. These operated cases present that group upon which the rotation and displacement of the fragment is so serious that no other form of reduction is satisfactory in our experience. The fractured surface of the condylar fragment (See X-ray Plate VIII) is turned upward and outward with general downward displacement. The rotation of the fractured surface of the fragment away from the humeral end makes a return to position, without entering the joint, practically impossible. This type of fracture was first recognized here by Dr. J. S. Stone, and the technique of the open reduction advocated was developed by him. All of the earlier cases were operated upon by him and to him are due the four perfect results in cases operated upon immediately, and the excellent result from the point of view of improvement in the fifth.

The internal condyle fractures were five in number, and a perfect result was secured in each case. In only one case was the displacement a factor of any difficulty (H. E. C.). Since the fragment came forward into the joint, an internal angular splint was used. The recovery of perfect function was slow. Fourteen months after reduction there was a persistent limitation in extension of 10 degrees. Called in for special examination eight years after injury, the arm was found to be perfect in every respect. The factor of growth emphasized by Treves probably entered into the removal of the limiting prominence and the return of perfect function.

Massing the cases without respect to type, degree of displacement, or special details of after treatment, forty-one perfect results, three imperfect results, and one untraced case of excellent promise one month after treatment have been secured, so that in slightly more than 91% of the cases, a perfect arm has been secured.

The outline of treatment used in these cases has comprised x-ray as well as clinical examination before reduction for the accurate determination of displacement. Reduction by manipulation in all cases amenable to this process. Immobilization in hyperflexion unless swelling of the arm or other fracture complications prevents the most acute position and necessitates some degree of extension. (E. G. and L. P.) In special forward displacements an internal angular splint has proved very effective in securing and maintaining position. Immobilization for a period of three weeks or over. The avoidance of massage and passive motion in after-treatment. The encouragement of natural use of the arm by the child to insure the return of function, with the reliance that the instinctive avoidance of pain will restrict undue movement so long as necessary. Non-interference with a persistent slight limitation in movement, which experience shows that growth will eliminate in time. For displacements which are irreducible, operative reduction is practised immediately after the injury, before swelling has taken place, or a few days later, when the swelling has had time to subside. The operation as practised by us consists in making an incision over the external condyle and carrying it into the site of fracture. In the cases of rotated external condyle fracture, the fragment is rotated back to its normal position and the arm placed in the position of acute flexion which has proved adequate for keeping it in place. In supracondylar fractures a similar incision is

used, and the distal fragment is pried down into place with a blunt dissector or other suitable instrument. The arm is then immobilized in acute flexion. It has never been found necessary to use silver wire or other appliance to hold the fragments in position, and we deem it very unwise to introduce any foreign body at a centre of growth.

From this analysis it is seen that the practice pursued in our clinic and in those of Ashurst, and Treves and his colleagues is very similar, the only difference of importance being that we resort to open operation occasionally in cases that Ashurst would not, and that in those same cases we resort to operation soon after the accident, rather than delaying for six months or a year, as would Treves. With this practice Broca, Mouchet, Destot and others are in accord.

In conclusion, we may state that after a careful study of the work of Neuhof and Wolf, we do not believe that their conclusions are correctly drawn, nor that their results justify the adoption of early passive motion and massage as valuable treatment. That the result of our operative interference in a few selected cases to some extent justifies its employment. That acute flexion is the position of choice for immobilization of the great majority of fractures of the lower end of the humerus, and that when not applicable, common sense will dictate what position and apparatus should be employed to secure proper alignment of the fragments. That from three widely separated clinics, cases treated upon general lines of similarity have yielded approximately 90% of perfect results; and that a fracture of the lower end of the humerus in a child treated properly should result in a perfect arm in nine cases out of ten, and a useful arm in practically every case.

THE MASSACHUSETTS TUBERCULOSIS DISPENSARIES AND THEIR RELATION TO THE PRACTISING PHYSICIANS.*

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ON June 22, 1911, the following Act was approved by the Governor of this State.

"Be it enacted, etc., as follows:

"Every city and town containing a population of ten thousand or more, as determined by the latest United States census, shall establish and maintain within its limits a dispensary for the recovery, treatment and supervision of needy persons resident within its limits and afflicted with tuberculosis, unless there already exists in such city or town a dispensary which is satisfactory to the state board of health. The said dispensaries shall be subject to the regulations of the boards of health of the cities or towns in which they are respectively situated. A city or town subject to the provisions of this Act which, upon the request of the state board of health, refuses or neglects to comply with the provisions hereof, shall forfeit not more than five hundred dollars for every such refusal or neglect."

In 1914 this Act was amended by providing that the said dispensaries "shall be inspected by and be satisfactory to the state board of health."

No effort was made to enforce this law until 1915, when notices were sent out that cities and towns refusing or neglecting to comply with it after a given date would make their explanations to the attorney-general. A list of minimum requirements which would be satisfactory to the state department of health was sent to each city and town that came under the provisions of the law, and the district health officers went to work explaining, persuading and urging the authorities to action. As a result, on the date set, every city and town concerned had established a more or less effective dispensary. Some got excellent results at once and appreciate the value of the institutions; others haven't seen it clearly as yet. The medical profession is, perhaps naturally, suspicious of a "dispensary," and I wish to explain here what the intent is in this so-called "dispensary plan," and what its relation should be to the practising physician.

The procedures for the protection of the public in the ordinary run of communicable diseases are well known. The diseased person is so isolated and cared for that opportunities to spread the disease to others are reduced to a minimum. Persons exposed to and liable to develop the disease are quarantined and watched until the period of incubation is past. Tuberculosis is exactly like any of these diseases in the fact that it is communicable. It is transmitted from one person to another, probably usually by contact, just as they are, and the same methods of protecting the public would be exactly as effective. But tuberculosis, instead of being an acute trouble, is usually chronic and of long duration; the period of incubation may be interminably long, a person may be infected for many years before he shows signs of being diseased; instead of being an epidemic disease it is endemic, and nearly the entire population are tubercular at some period in their lives. The character and history of this disease makes its control a very different problem from that concerned with diphtheria or scarlet fever. The principles are the same, but their application in the same way would put so large a per cent. of the population into quarantine for so long a

* Read before the Medical Societies of Northampton, Holyoke and Westfield.

time that their support would be a financial problem of magnitude. For these reasons our method of procedure must be modified.

Tuberculosis occurs in many forms. The one with which we are chiefly concerned is the pulmonary type. Other forms,—glandular, bone, skin, abdominal, etc., claim many victims, but are not the commonly transmitted, danger to the public that the pulmonary type is.

From the public health standpoint, persons actively or potentially a public tubercular danger may be divided into three classes. These classes are not sharply differentiated; they overlap and run into each other more or less, but still, for practical purposes the distinction holds pretty well.

First. The definite open cases, the "advanced" cases, where the bacilli are being thrown off to the extent of being demonstrable. Those in this class are usually pretty thoroughly diseased, and a large per cent. of them either do not recover, or get well with a permanent handicap.

Second. The "incipient" cases, diseased but not throwing off bacilli in demonstrable quantities. These are the favorable cases, with excellent prospects of making good recoveries under proper care.

Third. The exposed and probably infected, but not yet diseased persons. This class contains the members of the family and the close friends of the other classes, who have been exposed to infection. They may be able effectively to resist this infection. They may hold it dormant for years and unexpectedly develop tuberculosis after some physical depression. They may develop it quickly and pass into the other classes.

As stated above, there can be no sharp distinction between these classes. If rated on laboratory findings alone, a case classed as "advanced" may not be so extensively diseased as another classed as "incipient," because of the superficial location of the ulcer that is pouring out germs in the one and the deep location of the cavity that is confining them in the other.

For the *first class* we have hospitals. Many cities and one county have their hospital, where the patients are largely bed cases, where they are made as comfortable as possible, where those who can recover are given their opportunity, where friends can readily visit them, and where the "open," dangerous cases are removed from the possibility of infecting their children and friends in their homes. There is at present a movement on foot to establish hospitals in all sections of the State for the accommodation of those cases comparatively near their homes, and the consequent relief of the sanatoria of their present burden of advanced cases.

For the *second class* we have sanatoria. These are located in comparatively inaccessible places, where the excitement of visitors can be kept at a minimum and the favorable, "incipient" cases can be given their opportunity for recovery. The sanatoria are at present loaded with too great a proportion of cases of the first class. The Rutland Sanatorium, for example, where every effort is made to limit the admissions to the more favorable cases, has about 50% of its beds occupied by "advanced" cases, very effectively shutting the doors of the institution against numbers of the very class of patients for whose benefit the Sanatorium was established.

With these two weapons we have been fighting the disease after it had come into the open, but until now we have taken no public measures to protect and aid those exposed and probably infected, but not yet diseased.

For this *third class* we have established dispensaries. The name is unsatisfactory. A "dispensary" is commonly understood to be a place where people come for *treatment* when they can't afford to pay for it. You know well the uselessness of ordinary "treatment" in tuberculosis, and the State does not purpose to foster quackery. To the physician a "dispensary" often means a place where people get for nothing, things for which they could at least pay him a part of the usual fees, and he looks on it as rather his enemy than his friend. If the tuberculosis dispensary is primarily intended to supervise the third class of patients, viz:—those exposed and probably infected but not yet diseased, it is evident that treatment cannot be a very important part of its work. A certain number of diseased persons will certainly come for treatment and will get it, but that is not the main end and object of the dispensary.

Each dispensary should be a complete reference library of general tuberculosis information and of local epidemiological facts, provided with proper equipment, both material and personal, for the application of this general information to the local epidemiological facts recorded there.

If a case of diphtheria is reported to a local board of health, certain facts should be, and generally are, recorded there at once. Where does the patient live, what are the home conditions, can he be isolated there or must he be removed to a hospital, who have been exposed to the case, where do they live, and what is necessary to do in order to keep them under observation during the period of incubation? Tuberculosis is also a communicable disease, transmitted in about the same way, and is a greater factor in the death returns; but how many of these epidemiological facts in regard to it do you find on record? Usually the date, the name and address of the patient and the name of the doctor reporting it. Often you will find that the death certificate was filed within a few days of this report.

To fight tuberculosis successfully the conditions surrounding each case, and the probable channels of infection from it, must be known and watched, and this is the function of the dis-

pensary. It should be the tuberculosis clearing-house of the community. There every one who has a right to the knowledge should be able to turn at once to every detail of epidemiological information necessary to combat the spreading of the infection from any given case. This information must include all pertinent facts regarding the actual case, and also the facts concerning all persons who are and who have been exposed to it so that they may be advised and supervised during the long period of incubation.

The material and personal equipment for the dispensary, as worked out by the state department of health is as follows:

In the circular letter sent to the cities and towns coming under the provisions of the law, a statement of minimum requirements was made. These included a set of uniform printed blanks for records, a simple office equipment, required two rooms with certain conveniences, the attendance of a properly qualified physician for examinations, advice and treatment, and the employment of a dispensary nurse. The estimate of the relative value of these requirements might be stated as, 5% office and equipment, 15% physician and 80% nurse.

The dispensary should be centrally located in order that patients may get to it readily. In most places special rooms have been provided, and often these are in direct connection with the offices of the board of health. Other things being equal, this last arrangement has been a very satisfactory one.

The office equipment called for is sufficient to insure the comfort and convenience of both the officials and the patients, to provide a complete and quickly available system of records and a safe place for storing them.

The part of the physician is an important one. He must be qualified to make pretty delicate differential diagnoses, must be sufficiently interested in the work to stand up under the routine, and must be of such a character and with such a reputation for square dealing among his fellow practitioners that they will not be afraid to send their patients to him for examination. The majority of his duties will lie among those who cannot afford to pay much money for their medical work. Still, no physician can tolerate the alienation of any patient, therefore the man in this position must be one whom the other doctors can and do trust, not only to be square in the matter of diagnosis, but also not to damn them with faint praise or by deprecatory remarks. He must have a large knowledge of human nature. Persons coming to the dispensary for advice and treatment will be, in a large number of cases, of the uneducated, suspicious type. Many of them, the majority perhaps, will be those who are not then sick, but who are protected against being sick in the future, and who will not really believe that they are in any actual danger. At best, it will not be an easy and simple process to get these people to attend with the desirable regularity and frequency. The attitude and the diplomacy of the dispensary physician will often be the crucial factor with them. If they feel that they are getting anything of value from him, either in medicine, sanitary advice or even in cheering and interesting words, they will be more easily induced to keep coming. They may think it is a fool proposition, but the nurse can get them there if there is anything in it for them from their own standpoint. If, however, the doctor is of the wrong sort, it would take a bench warrant to get them there more than once.

The qualifications of the dispensary physician and nurse are as much under the supervision of the state department of health as is the rest of the dispensary equipment. In one city it was suggested that the office of dispensary physician be included among the duties laid by ordinance upon the city physician. This plan was disapproved because city physicians come and go, and a man might well be elected to that office who would be worse than useless in the dispensary.

We allowed an 80% valuation to the nurse, for it is chiefly through the work of the nurse that the information is to be obtained, the information that is the foundation on which the whole dispensary work is built.

"Nurse" is a poor term. She is not really a "nurse," she is a combination of clerk, social worker, directory of sources of available aid, co-worker with every benevolent association, close friend of the patient and his family, employment agency, and the personal agent of every doctor in the community. She must know all about every case in her bailiwick, not only the actual physical condition of the patient, but also the family financial and social conditions that play such an important part in this sickness. This does not mean that she is to drag every case and its contacts to the dispensary, and have them examined and advised there. Such cases as are referred to the dispensary by the board of health, by associations or by physicians, as needing the attention but not able to pay for it, should be examined, watched and advised there. Those who can and do pay their way with their own physicians should, of course, be watched and advised by them. No dispensary nurse should ever go to visit a private case without the previously obtained permission and advice of the physician in charge. If he thinks that for any reason whatever it would be unwise for her to go to any particular case she should not go there. She should get from this physician the facts needed for her records, both concerning the case and the contacts, and get them at reasonably frequent intervals. The physician will soon find that, instead of taking work away from him, she is increasing his work in that family. He will make more frequent examinations in order to give her the facts she keeps pestering him about, and which he realizes he ought to know. When he finally tells her to

go ahead and visit his patient, he will find that she is constantly urging that patient and family to come to him regularly for examination and advice, that she is his agent and coöperator, instead of an enemy to his pocketbook.

All doctors have some semi-charity patients on whom they cannot afford to spend the time that really ought to be devoted to them. If they send these to the dispensary for regular examinations, with a note or a telephone call to the physician explaining the situation, they will find that the report of the examination will be sent direct to them and that medical and sanitary advice will or will not be given to the patient, exactly as they may direct. No man's patients will be alienated from him; on the contrary, his patients will be advised to go to him at regular intervals, in all probability more frequently than has been their habit.

The nurse, in coming to physicians for details concerning the cases they report to the board of health, is not trying to butt in, she is trying to complete the official information on a public danger, and it is well within the rights and duties of a board of health to ask for such records. They are the base of our plan of campaign, the reports of our intelligence division.

It has been believed for some time that we have about all the laws we need for the control of communicable disease. True, the courts will not allow us to apply them in all cases, notably against incorrigible consumptives; nevertheless, we feel that we cannot get much further with control by laws alone, that our future advances must be by the education of the individual in disease prevention. No one has ever had such an opportunity for placing so much information in the very spot where it is most needed as the dispensary nurse will have. She will be at the focus of the disease, damming its ordinary channels of communication and spread. Her advice to the diseased and to the infected people will be given by the direction of and under the oversight of the dispensary physician or the private physician, according as the case is a dispensary or a private one. Her advice will carry weight and be followed in just the proportion that she has been able to gain the confidence of that family and its physician, and the results of her work in stamping out this disease ought to be little short of marvellous.

She will have information that will be of the greatest value to physicians in their work, information covering the character, methods and red tape of all the institutions in the state, both public and private, that care for tuberculosis cases. Tuberculosis is a prolonged, expensive disease, and in many instances, a family who could perfectly well handle the finances of a short, acute disease will need help in this situation. The nurse will know where help is and how to get it.

You see why we estimate the nurse's work at 80% of the dispensary. She has to be a person of peculiar abilities; no fool need apply. Anyone who has to insinuate her friendship into a sensitive, sick family and at the same time keep on terms of open confidence with our touchy profession has no bed of roses. A shut mouth is one of her most valuable assets, and that is not a common human attribute. The doctors can make her work easier when she comes to them or they can make her life pretty miserable and her work very discouraging. It is a hard job at the best and calls for about all there is in a woman—no man could do it.

These descriptions of the dispensary doctor and nurse are, of course, of the ideal. No mere human being could be so comprehensively all things to all tuberculous people as would be the case in a perfect institution of this sort. But as a matter of fact, those now in this work come much nearer the measure of this ideal than you would believe possible. None of them escapes shortcomings along some of the lines, but all of them have their extremely valuable qualifications for the work. They are working hard and are getting results, and, from a clearer understanding by physicians in general of the intent and scope of this branch of the work, there should come a fuller measure of coöperation and a correspondingly greater harvest.

In the past we have been going after tuberculosis from one end and in the middle; we believe that through this dispensary work we shall be going at it from the other end also. The record of the fight is good now; we are reducing the gross amount of the disease, but the wiping out of the remainder will be the hardest part of the work.

The dispensary is established to reach the class of persons not provided for by the sanatorium or by the hospital,—the class of exposed and presumably infected people. Treatment of diseased cases there is a small part of its work. Its greatest service to health officials will lie in its recorded facts covering the situation, physical condition and mode of life of diseased persons who remain in their homes and of those persons who have come in contact with tuberculous cases. Its greatest service to the public will be shown in the improved hygienic conditions in infected households, due very largely to the advice given there by the dispensary nurse. It is believed that the dispensary plan will be of great assistance to the physician and not in any way a hindrance to him. In order to get the best results from its work, the cooperation of the medical fraternity as a whole is needed, and we hope to have this in full measure.

The anti-tuberculosis societies, in combining their social service work with their material and medical attendance, were working along this same line. We hope to be able to carry it still further and get still more complete results by putting this work directly under the authority of those whose official business is to protect the public from disease.

A YEAR'S WORK OF A LOCAL TUBERCULOSIS HOSPITAL.

By Albert C. Getchell, M.D., Worcester, Mass.

The Worcester Tuberculosis Hospital is an addition to a hospital plant the City of Worcester has maintained for several years for the treatment of diphtheria and scarlet fever under the care of the Board of Health. Before this addition was made, it was called The Isolation Hospital. It is now the Belmont Hospital. The name indicates its situation, on a fine hill. Belmont Street is the name of the street on which it is located and "Belmont Street" is the sign on the street car that goes directly to the hospital. The Tuberculosis Building is named the Putnam Ward, in honor of Mr. Henry Putnam, who gave to the city the land on which the building stands.

The building is a substantial brick structure, two stories in height, facing the south. It consists of a central building, in which is the administrative office, an assembly hall, and nurses' living rooms. A wing extends from this building to the west, which is the hospital. The complete plan calls for another wing, extending to the east. Each floor of the medical building has one four-bed room, two two-bed rooms, four one-bed rooms, a sun room with abundant window space, one open ward for sixteen beds, service rooms, and out-of-door porches.

The administrative and medical staff consists of (1) the board of health, the office and laboratory of which is at the City Hall, and is also the headquarters of the tuberculosis nurse; (2) The superintendent of the hospital, who has general charge of the local administration and is the local medical officer; (3) A visiting physician, who makes a visit each week day, seeing every patient on each visit, and makes and records all physical examinations; (4) One male supervising nurse and twelve female nurses.

An out-patient department is maintained at the hospital. This serves as a place for examination and advice for patients discharged from the hospital, patients referred by the city tuberculosis nurse, those referred by other clinics and physicians, and such other poor persons as wish to come for advice and treatment.

Before the hospital was opened, the board of health established the policy that only such persons as had tubercle bacilli in their sputum were eligible for admission. This decision rested on two grounds: first, that the hospital was built and maintained by the city primarily as an instrument of public health, and that bacillary patients only were a danger to the public; and secondly, that it is impossible absolutely to determine that a case of pulmonary disease, especially chronic disease, is tubercular without the evidence of tubercle bacilli. It is not necessary that the sputum be found positive at the time of application. If there is a record of positive sputum at the board of health office, the applicant is eligible. Besides this record a report of positive sputum from the laboratories of the four state sanatoria is adequate. This rule has been held to except in a very few instances of sudden emergency like severe hemorrhage, when the patient could not be taken immediately at the City Hospital, and cases of evident consumption under destitute surroundings. The results thus far have justified this policy and there is no disposition to depart from it.

The hospital was intended primarily for advanced and dying cases and those cases are given precedence of all others. But if there is room, the early curable case is admitted and kept until it can be taken at Rutland. This is a very important work. Suitable daily supervision of all the details of a patient's life, in the interval of ten weeks to three months after application is made before the patient is taken at the sanatorium, spells the success or failure of the cure.

The capacity of the hospital is 55 beds. At present this seems to meet the needs of the city. Very few patients have been kept waiting for admission and all whose needs were urgent have been admitted at once.

It appeared early that many more men applied than women, and the open women's ward upstairs was given up to the men, the relation of men and women being about 43 to 12.

The hospital being built and maintained by the city, it is evident that it be reserved for the bona fide city case and others be admitted only as excess population, or by special arrangement satisfactory to the city, which means that cases having a settlement in other towns in the state shall be suitably and adequately paid for by those towns, and that state cases, able to be moved, and whom it is not convenient for the hospital to care for, be removed by the state to another place. I am sorry to say that neither of these conditions has been satisfactorily fulfilled. Of the 148 patients treated during the year, 54 were not citizens of Worcester.

The discipline of the place has been and is a matter of careful, not to say anxious, thought. The problem is a difficult one. The hospital was built and is maintained by the city at considerable expense and the city, if for no other reason, has a right to look for adequate returns for its outlay of money. No work, public or private, goes by itself. System, order, and control are essential in every activity of life, and particularly in those activities involving the welfare of a group. The purpose of the hospital is twofold: to protect the community from an infective disease and to relieve suffering humanity. The difficulties to be encountered lie mainly in the physical condition and habits of the patients. Many of them are not sick enough to be in bed and their activities have to be circumscribed. Some have never practised much self control, and have been addicted to the use of alcohol. All these conditions require the oversight and restraint of a controlling power, for the patients'

own good as well as that of others, and of the institution as a whole. On the other hand the hospital is a place of last resort and, whether the final illness be brief or prolonged, it is the last home that many will have on this earth. So far as any public place can be a home this should be one. The patients should have constant, skillful, sympathetic, kindly care. No effort should be spared to prolong life, or, if that is impossible, by assiduous attention to give the patient, who feels his life slipping away, the comfort of human sympathy and support. The scheme of discipline is based upon the foregoing considerations, and while it is intended to allow the largest freedom compatible with hospital efficiency, the limit of that freedom must be respected on pain, it may be, of summary dismissal. The plan has worked well and we feel convinced that it is the best plan, not only for the hospital, but for the patients, and the safe-guarding of public health.

The number of patients treated during the year was 148—106 men and 42 women. Except one child who was kept at the hospital pending other disposition of her, all were over 14 years of age. Of this 148, 84 had a Worcester settlement, 16 a settlement in other cities and towns of Massachusetts, 43 were state cases, and 3 had settlements undetermined; 3 were classified incipient, 56 moderately advanced, 87 advanced, and 2 non-tubercular; 62 died in the hospital, 9 were transferred to state sanatoria, 9 eloped, 12 men returned to work, 2 were discharged for drunkenness, 15 on request, though they could properly have remained longer, and 16 were discharged against advice. Some of these have died outside during the year, and this number, if it could be known, should be added to the 62 who died in the hospital.

In the out-patient department 140 patients were treated.

The treatment has been hospital treatment modified to meet particular cases. We have not to any extent employed so-called specific treatment such as tuberculin and artificial pneumothorax. The whole hospital has the open window much more than a general hospital. Patients are classified according to their particular needs. Feeble elderly persons with stationary or slowly progressive disease are made as comfortable as possible, relative to the open windows. Those also who have pronounced asthmatic symptoms graduate the open window according to their comfort. The ambulant patients—and they are mostly men—have their beds in the large wards which serve as dormitories. Other patients, as their condition requires, are put in the smaller rooms. Advanced cases near death, particularly if they have been to sanatoria, demand the open window, and the open window is used with others unless they are definitely more comfortable without it. All patients who have a reasonable prospect of either cure or material improvement are closely supervised as to out-of-door life during the day and the open window at night, and regulated exercise as well as their feeding.

We have carefully studied tuberculosis of the larynx. The larynx of every patient is examined on admission, and once every two months during residence, whether or not there are symptoms. Chest examinations are also regularly made at these times. At any time, however, if there are symptoms, a laryngeal examination is made. Nearly every patient has been examined. Those who have not were those who lived but a few hours after admission, and their condition was such as to forbid examination. Twenty-five had on admission tubercular involvement of some part of the larynx or of the epiglottis, and five developed tuberculosis of the larynx during residence. All these died. Treatment has consisted of complete rest of the larynx by non-use of the voice and systematic general care. As these patients are usually very sick, this is not difficult to carry out.

Local treatment we use as little as possible, and only for symptoms, particularly pain and dysphagia. It is an interesting fact that relatively a few have had pain. Although I know of the laryngeal condition, as a rule, I do not tell the patient of it, and while I ask the attendant often as to pain, I never ask the patient until the information has first come from him. Less than one-third of the cases, I should say, have had pain, and some who have had pain were free from it as they neared the end of life. For the relief of pain we have found inhalations of menthol, anesthesin lozenge, two per cent. cocaine spray, and the injection of eighty per cent. of alcohol into the superior laryngeal nerve useful.

I would not imply by what I have said that more active treatment of laryngeal tuberculosis is ineffective. Indeed our experience with galvano-cautery and the removal of the epiglottis in patients at the Rutland Sanatorium proves the contrary. But in none of these cases have I considered these measures advisable, except one, —a patient who had extensive laryngeal and little lung disease. Hoping that the removal of his epiglottis would relieve his dysphagia and give him a chance for life, I operated on the epiglottis. But it did no good. The disease rapidly extended even over the pharynx and he died.

We have also studied the relation of nasal trouble and tonsils to the pulmonary and laryngeal disease. We have observed no greater incidence of laryngeal tuberculosis in obstructed noses than in unobstructed noses, and we find that enlarged tonsils and history of tonsillar trouble is comparatively infrequent.

The most impressive lesson we have learned is that far advanced pulmonary and laryngeal disease is not incompatible with the ordinary activities of life. We have had several patients, mostly men, who gave a history of only a few days and at most a few weeks' illness, but who were found on admission to have extensive pulmonary and laryngeal disease and lived but a short time.

A SUGGESTION AS TO THE PREVENTION OF INFANTILE PARALYSIS.

By W. Stewart Whittemore, M.D., Cambridge, Mass.

Assistant Visiting Surgeon to the Cambridge Hospital.

There has been much criticism of the medical profession because of its failure to give out to the public definite advice as to how to prevent infection with infantile paralysis. All the measures which have been suggested thus far have been of the vaguest kind, such as washing the hands before eating and keeping children away from any child who is known to be sick. This criticism is the more justified because those in charge of the fight against the epidemic of infantile paralysis in New York have given the public the impression that we know all about the disease and that there is nothing to warrant alarm on the part of parents. In spite of such reassuring statements, the number of cases has steadily mounted to over five thousand, and the end is not yet in sight.

How much better it would have been to acknowledge frankly that we are in great ignorance as to this disease, which has been studied seriously for less than ten years. We do not yet know what the incubation period is nor how long to isolate a patient after the active symptoms have subsided. To avoid further misunderstanding, the public should be taken into our confidence in this matter and asked to be patient while we experiment with various methods of preventing the infection.

I wish to offer a suggestion as to a possible method of preventing children from becoming infected with infantile paralysis, in the hope that it may be tried out to determine whether it is of value or not. About a year ago, Hektoen and Rappaport[1] published a report on the use of kaolin to remove bacteria from the nose and throat. They found that by insufflating kaolin powder in the nose they were able to remove diphtheria bacilli and also practically all bacteria from the nasal mucous membrane in the course of from three to four days. The swallowing of the powder was followed, likewise, by a rapid disappearance of the diphtheria bacilli from the throat. They found that in scarlet fever the kaolin removed streptococci from the nose very promptly. Their method was to spray the finely powdered kaolin into the nose six or seven times a day at two-hour intervals by the use of a powder-blower, being careful first to have the patient blow the nose to remove any discharge which might block the nasal passages and thus prevent the powder from thoroughly coating the mucous membrane. The insufflation was repeated several times at each treatment.

In order to secure the most thorough application of kaolin to the throat their patients were instructed to swallow very slowly one-third teaspoonful of the powder, four or five times an hour during the day. In a number of diphtheria carriers, complete and apparently permanent removal of the bacilli was accomplished in this way in from two to four days, and the throat, to a large extent, was freed from all bacteria.

So impressed was I with the results obtained by Hektoen and Rappaport that for the past year I have been using kaolin powder as a routine in the treatment of nose and throat infections. I began by employing it on myself and on members of my family in the treatment of coryza and tonsillitis. I found that it apparently cleared up these infections very promptly, and, moreover, was not irritating, but distinctly soothing in its effects. Similar results were obtained by its use in my private practice.

I made one modification in the method of application of kaolin to the throat. It is rather unpleasant to swallow the dry powder, but I discovered that spraying it upon the mucous membrane of the throat by means of the powder-blower is apparently just as effective as swallowing it.

Although we are still in great ignorance as to the mode of transmission of infantile paralysis, it is pretty well agreed that the most common avenue of infection is through the mucous membrane of the nose. Hence it seems to me logical in combating the disease to use a substance which has been shown to be capable of practically sterilizing the nose and throat and is, moreover, free from any irritating effect. Far from being a chemical poison, it can be swallowed in large amounts without any poisonous effect upon the taker. Its action is peculiar in that it owes "its efficiency in bacterial infections to its action in depriving the bacteria of a suitable culture medium while mechanically burying them alive, separating them from the mucosa and other tissues by a protecting, comparatively impermeable coating."[2]

I should especially urge the use of kaolin as a prophylactic measure in the case of every child or adult who has come in contact with any possible source of infection with infantile paralysis. It has been shown conclusively that healthy persons in whose households the disease occurs are frequently carriers of the infection. Kaolin should also be used by patients suffering from the disease and by those who have recently recovered from it, because swabs taken from the nose have demonstrated the presence of the virus in such persons long after recovery from acute anterior poliomyelitis.

The history of the discovery of the bactericidal action of kaolin or fuller's earth is of interest. Stumpf of Würzburg noted that human bodies buried in clay did not decompose readily, but seemed embalmed. He began to experiment with the use of bolus alba (kaolin) internally and found it of great value in infections of the intestinal tract. In the present European War the Germans have been using it in

cases of cholera, dysentery, and typhoid fever with great success. Stumpf[3] reports that the microscopic findings in the feces of the patients fully warrant its use. Wolff-Eisner[4] states that he believes kaolin a very efficient treatment of cholera. "He regards the kaolin-charcoal treatment as a kind of immunotherapy, basing his belief on Hofmeister's dictum that all the phenomena of immunity are colloid chemical reactions. He believes that the kaolin binds toxins which are beyond the reach of serotherapy."[2] These results suggested to Hektoen and Rappaport the use of kaolin in infections of the nose and throat.

From my own personal experience with kaolin powder in the treatment of infections of the nose and throat during the past year, I suggest its use as a possible method of preventing infection of children and adults with infantile paralysis. It should be insufflated into the nose and throat every two hours during the day. Only by its use in a large number of cases where there has been exposure to possible infection with acute anterior poliomyelitis can it be determined whether it is of value or not.

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PRE-OPERATIVE ROENTGENOLOGICAL EXAMINATION IN CANCER OF THE BREAST.

BY JOHN W. LANE, M.D., F.A.C.S., BOSTON.

UP to the present time no completely satisfactory treatment for cancer of internal organs has been found, the nearest approach to the ideal procedure being the excision or cauterization of the growth in its early stages; and statistics from the leading surgical clinics of the world are beginning now to show encouraging results from the employment of early radical surgical measures. It is the purpose of this paper to assist in preventing the valuable radical operation for cancer of the breast from coming into disrepute with the laity.

Every radical operation for cancer of the breast followed by an early recurrence causes not only the patient to lose hope, but also forces a circle of the patient's friends to become distinct and forceful opponents of the surgical treatment of cancer. When a death ensues shortly after a radical removal of the breast for cancer, another and more vigorous body of laymen become antagonists of surgery. The general practitioner of medicine, to whom these cases are first entrusted, also comes into his meed of distrust for surgery when he sees his patient return from the surgical clinic without a cure, after having been subjected to a frightfully mutilating and depressing surgical operation. Such results of surgery prevent patients with early favorable lesions from seeking the surgical treatment which today offers so much. Early recurrences and early post-operative deaths are due, not to the operation *per se,* but to the performance of this efficient operation upon badly selected and already hopeless cases.

Before approaching the actual methods of procedure, which the title of this paper suggests, it is well to recall a little of the pathology of carcinoma and consider briefly its method of metastasis. The dissemination of cancer occurs in several ways,—through the lymph and blood vessels, and by fascial permeation. Cancer cells ulcerate into the lymphatic stream and blood vessels, especially the veins, and are thus distributed to various parts of the body. The permeation theory is expounded by Handley and is based on the observation of many post-mortem cases, and at present is strongly accepted. This theory propounds in the main that cancer of the breast extends by columns of cells along the deep fascia, attacking first, naturally, organs or structures in the immediate neighborhood of the growth. Thus, in cancer of the breast, the pleura, the liver and the long bones, at sites where the deep fascia is inserted in them, are early affected. It is very rare to see cancer of the bones of the forearm or leg, because the patient is usually dead before such condition could exist, but organs and skeletal structures remote from cancer of the breast are often attacked by its dissemination; and once a cancer of the breast has metastasized to other organs, operation is useless. It is necessary, therefore, to operate before these metastases take place, and no operation should be undertaken until this dissemination has been ruled out, and it seems to me that the best method of determination of the existence of a metastasis is by roentgenological examination.

In the past year it has been my custom to subject every case of cancer or suspected cancer of the breast to a very complete roentgenological examination. It has been possible by this means to demonstrate in many cases metastases in the skeletal structure although clinically there was no evidence of their existence. We have demonstrated metastases in the mediastinum, in the femur, pelvis, spine and humerus; but not as yet, to our complete satisfaction, have we been able to demonstrate a pleural dissemination. Of course these cases were prevented from going to the operating table, and thus were not subjected to needless surgery. In two of the cases death has already ensued, and in two others, at this writing, is imminent.

I now wish to advocate as a routine, pre-

operative procedure, the examination, roentgenologically, of the chest, pelvis, spine, humeri and femora in all cases of suspected cancer of the breast. It may be objected that this method is expensive. That is true; but expense matters little when useless surgery is prevented. It may also be urged that a radical operation relieves suffering and prolongs life even in advanced cases; but actually how much longer is life preserved and how much suffering is saved than would be the case under skillful medical treatment? As far as I am aware, this is an original method,—as I have not seen any advocation of it in the literature,—and is presented with the hope that it will help to safeguard the radical operation for carcinoma of the breast, which is fast coming into ill-repute with the people.

Clinical Department.

AURICULAR STANDSTILL: AN UNUSUAL EFFECT OF DIGITALIS ON THE HEART, WITH ESPECIAL REFERENCE TO THE ELECTROCARDIOGRAM.

By Paul D. White, M.D., Boston.

[From the Medical Service of the Massachusetts General Hospital, Boston.]

Digitalis may affect the human heart and electrocardiogram in a variety of ways. A total bradycardia may occur in which the pacemaker in the sinoauricular node is depressed and slowed. Heart-block may be produced, varying from delayed A-V conduction to complete block, the grade depending on the amount of digitalis given and on the condition of the A-V conduction system. Ventricular escape may occur, due to a decrease of sinoauricular rate below the rate of the atrioventricular nodal pacemaker or to an increase of the lower nodal rate over that of the upper node. Aberrant ventricular complexes in the electrocardiogram may follow digitalis administration. In cases of auricular fibrillation large amounts of digitalis may produce a bigeminy due to the occurrence of ectopic ventricular contractions at every second beat. The shape of the *T* wave of the electrocardiogram is definitely altered by digitalis; if, for example, the *T* is upright in Lead II, it becomes depressed and finally inverted as the result of the administration of digitalis.

There is one further effect which may occur in diseased hearts after digitalis, which has not hitherto been described as such, so far as I am aware. That is the removal by digitalis of all evidence of auricular activity from electrocardiogram and from the jugular pulse tracing. There is no evidence that the auricle is contracting at all. Against the possibility of an isoelectric *P* in Lead II is the absence of *P* in Leads I and III also, and the absence of *a* in the jugular pulse. Auricular fibrillation may be excluded by the entire absence of fibrillation oscillations of the galvanometric string and the perfectly regular ventricular rate. The atrioventricular node is probably giving rise to the ventricular complexes, because their shape is that of the normal complexes of supraventricular origin and they occur regularly. No deflections appear suggesting that the atrioventricular node is also giving rise to auricular activity. In other words, there appears to be *auricular standstill*. This condition has been produced experimentally in the cat[2] by depression of the sinoauricular node by cold and depression of the junction of auricle and atrioventricular node by asphyxia.

Three cases have been found at the Massachusetts General Hospital in which this digitalis effect has been seen. All three showed definite evidence of auricular action in electrocardiogram and jugular pulse tracings after the effects of the digitalis intoxication had worn off; in all three the A-V conduction time showed some delay during the recovery from the digitalis. In none of the three, at the time of the disappearance of auricular activity, was there any evidence of auricular fibrillation, ventricular escape or complete atrioventricular rhythm.

Lewis[1] has reported one case of unusual bradycardia in which there was no trace of auricular activity in electrocardiogram or jugular tracing. No note was made as to digitalis administration in this case.

Electrocardiograms from the three cases seen at the Massachusetts General Hospital, without evidence of auricular activity, are shown in Figs. 1, 3 and 4. A short account of these cases follows:

Case 1. Man of 80 years, with arteriosclerosis and myocardial weakness. In June, 1914, a polygram showed a long *a-c* interval in the jugular pulse. On March 11, 1915, after about 2.5 grams of digitalis in the course of three weeks, electrocardiograms showed no *P* wave but did show a definite digitalis effect on the *T* wave, consisting of inversion of this deflection (Fig. 1a). Diastole was smooth, without evidence of auricular fibrillation. The ventricles were beating regularly. Fig. 2a shows a polygram taken this same day, also without evidence of auricular action. At other times this patient has shown ventricular escape with simultaneous auricular and ventricular contractions: *when auricle and ventricle beat simultaneously, very large waves occurred in the jugular pulse, representing* a *and* c *or* a *and* v *together.* (Fig. 2c.) Digitalis was stopped, and on March 21, 1915, a polygram showed normal rhythm, with a long *a-c* interval, and a pulse rate of 40. (Fig. 2b.) An electrocardiogram taken April 9, 1915, shows the normal rhythm with the *P* wave present in every lead, and the *T* wave returned to normal (Fig. 1b).

Case 2. Man of 69 years, with cardiosclerosis and

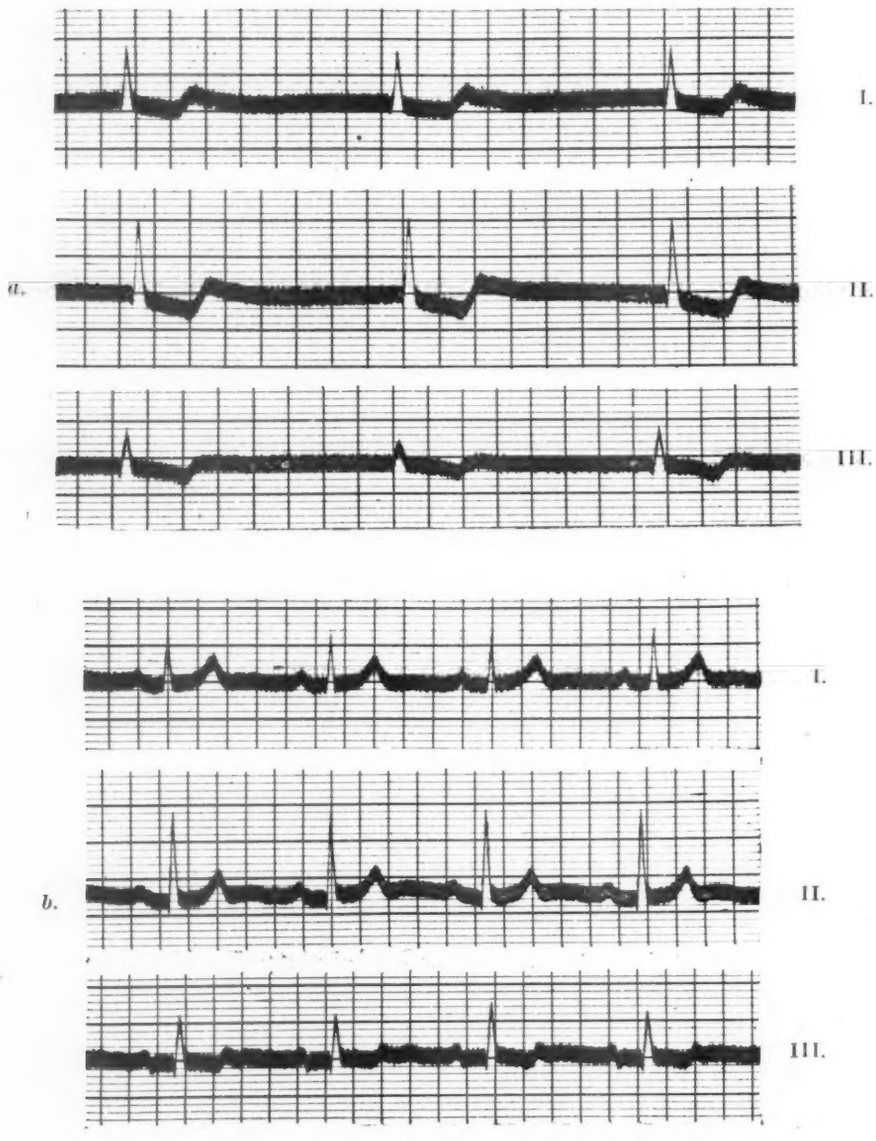

FIG. 1.

In Figs. 1, 3 and 4 abscissa = 0.2 second; ordinate = 10^{-4} volt.

a. The three electrocardiographic leads of G. H. A. showing digitalis effects—absence of auricular deflections and invert *T*. Rate = 39. March 11, 1915.

b. The three leads of G. H. A. showing normal rhythm with *P* present in every lead. *P-R* interval is slightly prolonged. Rate = 55. April 9, 1915.

cardiac weakness. On Nov. 28, 1914, an electrocardiogram showed normal rhythm and defective conduction in the right bundle branch. After 1.7 grams of digitalis an electrocardiogram, taken Dec. 15, 1914, showed absence of auricular activity (Fig. 3a). Atropin sulphate, gr. 1/50 subcutaneously, failed to change the electrocardiogram except for slight increase in rate. Digitalis was stopped and on Dec. 29 an electrocardiogram showed normal rhythm with *P* wave present.

CASE 3. Man of 37 years, with atrioventricular rhythm following auricular flutter, and already described in detail in a previous paper.[3] On two occasions, a month or more apart, the auricular deflections were made to disappear from all three leads of the electrocardiogram by courses of digtalis (2.0 grams in a week), as shown in one instance in Fig. 4a (Feb. 23, 1915). There was no evidence of fibrillation. He had shown a characteristic fibrillation record on a previous occasion during the transition from auricular flutter to the atrioventricular rhythm. On still a third occasion, after digitalis, a large number of the ventricular complexes were unattended by auricular deflections; those that were accompanied by them showed a marked delay in backward conduction across the auriculo-nodal junction (long *R-P* interval). In this case the sino-auricular node was not functioning and digitalis apparently blocked off the auricle from the atrioventricular pacemaker. An electrocardiogram, showing the return of the auricular deflections in the atrioventricular rhythm, is given in Fig. 4b.

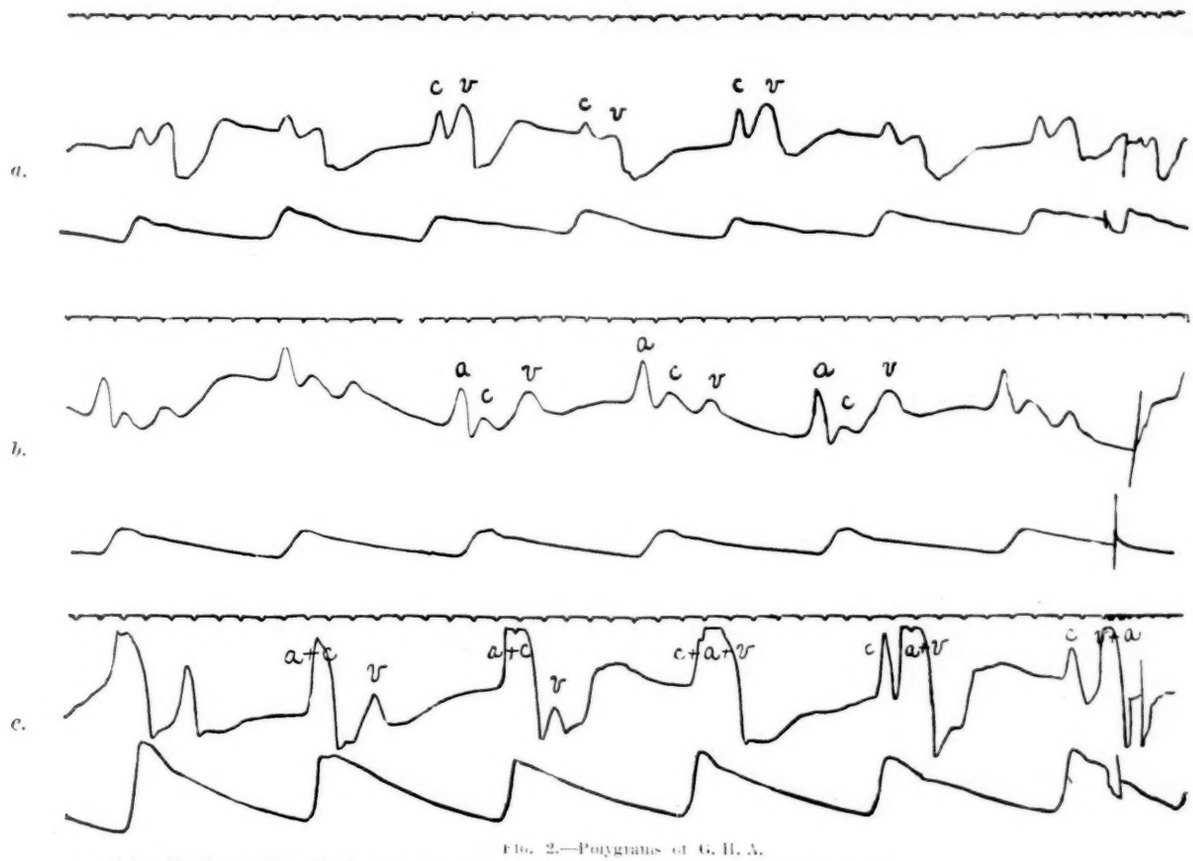

FIG. 2.—Polygrams of G. H. A.

a. Taken March 11, 1915, showing no *a* wave in the jugular pulse. Time interval = 0.2 second.
b. Taken March 21, 1915, showing *a* waves occurring regularly with slightly prolonged *a-c* intervals.
c. Taken March 23, 1915, showing ventricular escape. The *a* falls sometimes with the *c* wave and sometimes with the *r* wave. Confirmed by electrocardiogram.

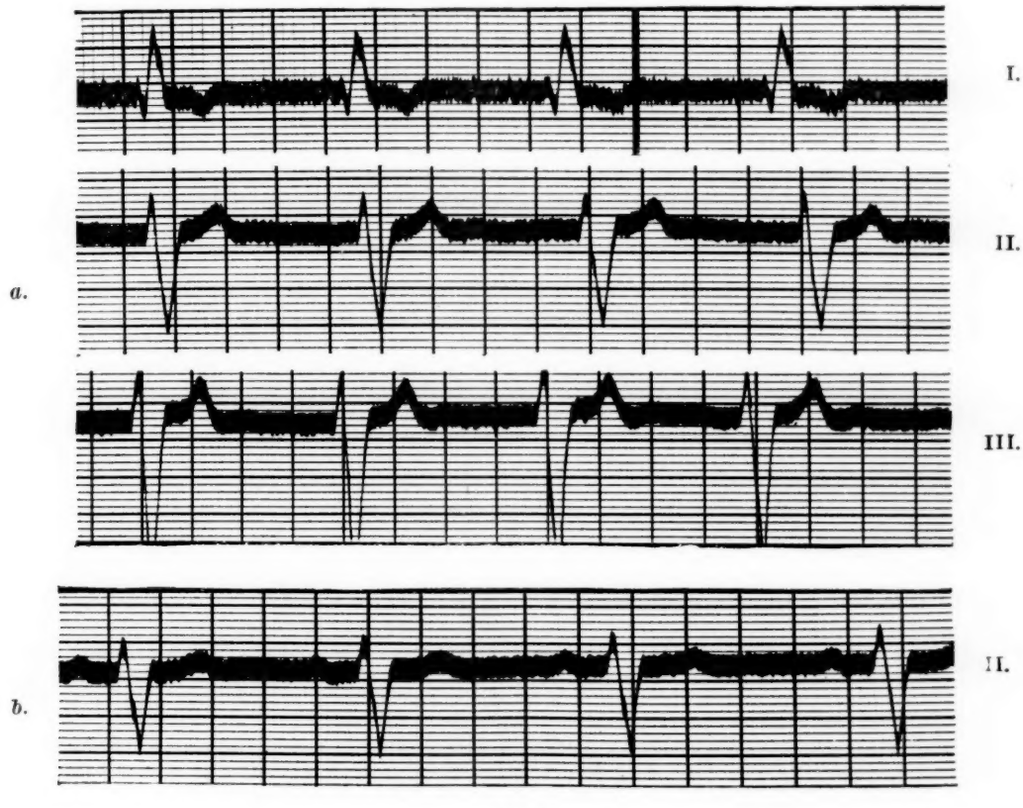

FIG. 3.

a. The three electrocardiographic leads of W. J. B. Dec. 15, 1914, with no evidence of *P* in any lead. Rate = 73.
b. Lead II of electrocardiogram of W. J. B. Dec. 29, 1914, showing *P* waves. Rate = 63.

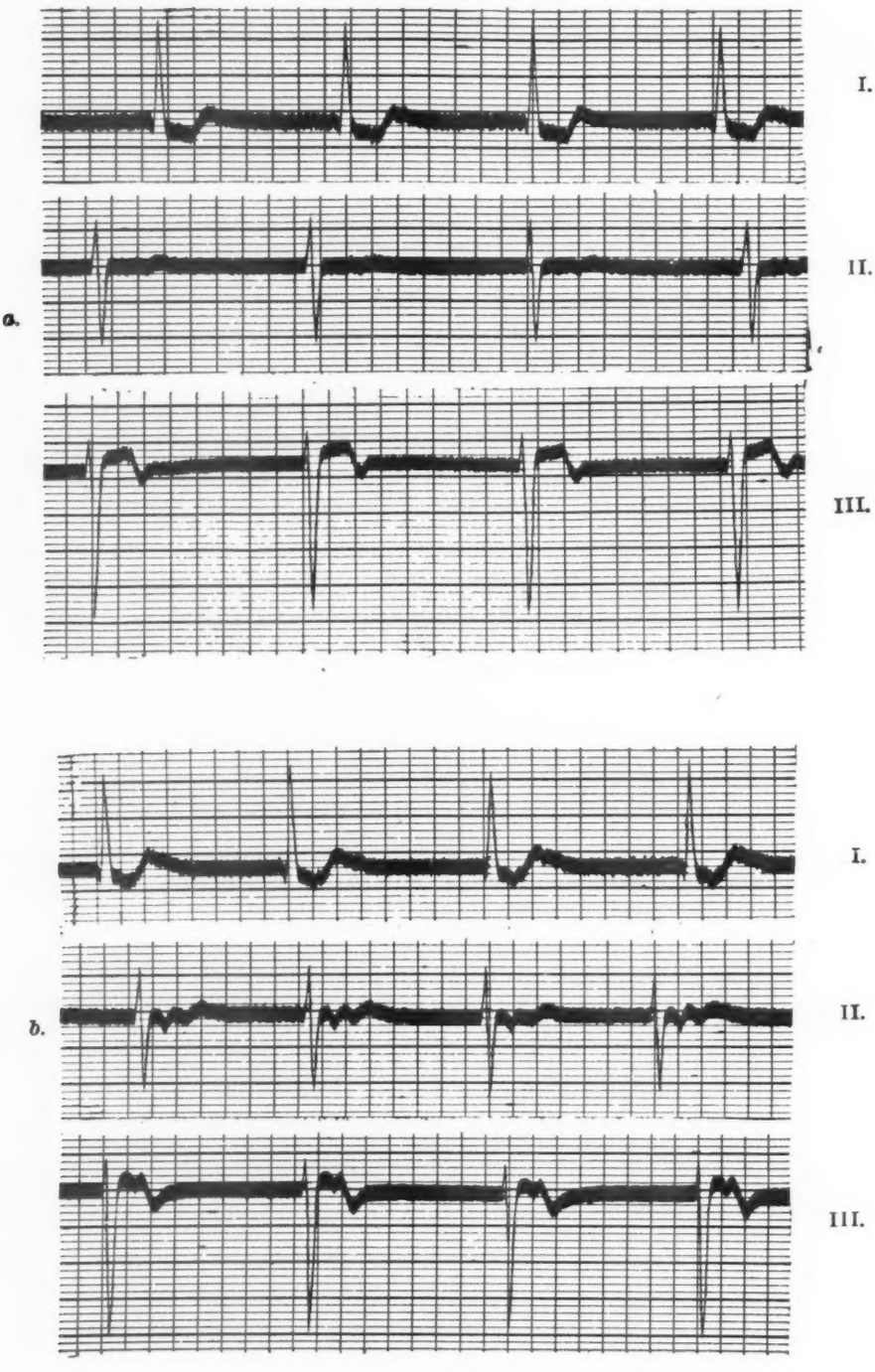

FIG. 4.

a. The three electrocardiographic leads of W. S., showing no *P* wave, Feb. 23, 1915. Rate = 37.

b. Electrocardiogram of W. S., showing atrioventricular rhythm with inverted *P* following the ventricular complex. Rate = 42.

SUMMARY.

Three cases of heart disease are described in which electrocardiographic evidence of auricular activity was abolished by digitalis. As soon as the effects of the digitalis had worn off, the auricular deflections reappeared. This is a rare result of digitalis administration.

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Society Reports.

NEW ENGLAND PEDIATRIC SOCIETY.

MEETING of February 4, 1916, was held at the Boston Medical Library. The President, Dr. A. C. Eastman of Springfield, Mass., was in the chair.

The following papers were read:—

1. Fractures of the Elbow in Children* (lantern slides). W. E. Ladd, M. D., Boston.
2. Physical Types—Dietary Control and Preventive Medicine. John Bryant, M.D., Boston.
3. D'Espine's Sign in Children. John Lovett Morse, M.D., Boston.

DISCUSSION.

DR. GREGG (Dr. Bryant's paper): There are few types of disease that we come in contact with in which inheritance plays a greater part than it does in mental and nervous diseases. When we talk of mental and nervous diseases we are on pretty thin ice regarding making any distinction between the two classes. We often speak of some patients as being only "nervous," and where the line is to be drawn between nervous and mental is a very difficult problem.

Analysis of cases has shown that neurotic individuals may bear children who develop manic-depressive insanity; individuals of a manic-depressive type may bear children who develop dementia precox, and dementia precox cases may bear feeble-minded children. In other words, individuals of one type of disease tend to beget offspring afflicted with a more serious type of disease. How much diet and gastro-intestinal abnormalities are to be considered as etiological factors in these different conditions I do not know. But if there is anything along the line of rectifying diet, or improving gastro-intestinal abnormalities which can be done to lessen the incidence of psychoneurotic or more serious mental conditions, we certainly ought to investigate the matter.

I tried some time ago to follow up Dr. Bryant's idea to see if there is anything in the theory that general paretics were individuals of a particular type infected with syphilis, while those who develop skin and visceral syphilis were of another type. The statistics did not come out in the analysis with great clarity, but what conclusion could be drawn suggested that you need a special type of individual in order to get general paralysis from spirochete infection.

DR. MORSE (Dr. Bryant's paper—first question): Dr. Bryant has referred to exercises which favor the development of the herbivorous type in children. I should like to know what exercises he would recommend to make the large intestine grow?

DR. BRYANT (replying to Dr. Morse): "Type" includes not only the intestine, but body form. There is no exercise that I know of that will directly change the length of the intestines, except perhaps the exercise they get in propelling bulky food, but there are exercises which will change the body form, and this is one step in the desired direction. You can enlarge the upper abdomen or lower thorax very easily, and then have present one characteristic found in the wide type, and that certainly is one factor in allowing room for the growth of all organs. One reason for the contracted thorax in the thin type is that there is, so to speak, nothing in their upper abdomen, and there is no reason why there should be a large thorax, if on account of ptoses the abdominal contents are largely in the lower belly.

DR. BRYANT (answering Dr. Talbot): There is no hard and fast method of differentiating between cause and effect in this study of type, but I think type is a factor which, if used with other things, throws some light on this question. In answer to Dr. Talbot, I would suggest that improper diet, by which I mean feeding the carnivore large quantities of starch, does, of course, easily produce distention. These people have apparently a thin intestinal wall with limited musculature, and I suppose it may be for this reason that an equal amount of starch produces less distention in the more strongly built or herbivorous person. The distention of the abdomen in childhood is probably due largely to gas formation, acting upon a congenital condition, whereas in later life the pendulous abdomen of the heavy person is almost certainly acquired, and due chiefly to overeating and relaxation of the belly wall. But considering only the congenital type, you will find as many of them with ptoses as you do in late life. There is a very small increase. I have not looked up my records on them for two or three years, but I think there are over 60% of demonstrable ptoses at birth, and about 75% in the adult. I think, however, that Dr. Talbot's question concerns both ends of the proposition,—the original form you start with, and an improper diet acting upon the weak intestine apart from any possible influence of such an actual disease as rickets.

DR. HILL (Dr. Bryant's paper): I should like to ask Dr. Bryant if there is any real evidence to show that the carnivorous type actually does eat too much protein food, and if the food supply has been investigated in these types?

DR. BRYANT (after Dr. Hill's question): A great deal of work has been done on the relation of meat diet to body type and intestinal conditions, and there is no doubt that in the carnivores among whom predominate pathologic kinks, excessive putrefaction easily occurs. Patients and others of this thin type have volunteered the information that in order to get any work out of themselves they have to eat meat. I have in mind at present a newspaper reporter who told me that although it did not matter much through the week what he ate, if he had any special important assignment, he had to have at least a pound or one and one-half pounds of beefsteak to "work on." Of course this is a casual remark and is not scientific, as nine people out of ten like meat when they can get it, but I think if you inquire among extremely thin people you will find that many more than half of them prefer a high meat diet because they cannot eat other foods with comfort or satisfaction. Many have fat and starch indigestion, and it is a very simple matter in these people to cut out the bulk of the starchy foods and increase their comfort accordingly by rearranging their diet.

DR. MORSE (Dr. Bryant's paper; Dr. Morse's second question): Suppose you have a child definitely of the carnivorous type. As I understand it, you think that the carnivorous type would thrive better on a carnivorous food. Now, also, you think it better for a people to be of the herbivorous rather than of the carnivorous type. Therefore, would

* See JOURNAL, page 220.

you feed such a child largely on a meat diet to favor its own digestion, or on the other sort of food to change its type?

DR. BRYANT (in closing, in answer to Dr. Morse's query about feeding the different type children): You have some ten or twelve years in which to study the child, so it is not a very difficult or acute problem. In many intestines of these carnivores angulations occur which favor putrefaction. There is one thing I might suggest in relation to Dr. Morse's remarks and that is, that although you might wish to feed an individual meat from your judgment of his type, if he has a sufficient amount of kinks, he will be unable to eat his meat continuously on account of recurrent putrefaction. I have found that many of these thin people who want meat and look as if they ought to thrive on it, can perhaps eat it for a day or two at a time without showing toxic effects. Then give them vegetables over a period sufficient to allow the intestine to get cleared out, and they can go back to their meat again, and thrive on this alternating diet. On the other hand, assuming a normal intestine, one may try to increase the amount of fibrous material in the diet to the limit of toleration for a year, or more, perhaps two years, thus forcing the intestine slowly to handle a more and more herbivorous diet. It certainly will be difficult, because most of these children do not like that kind of food. I think these are the children who are incessantly asking for meat. This certainly is not the question in a younger child, in whom adaptation to diet should be more simple. The apparent inconsistency inferred by Dr. Morse's question is easily explained. It is not desired to lose the good qualities of the carnivore, but merely to prevent his too extreme development, which does tend to make him undesirable. It is, after all, a question of common sense and long persistence with a definite object in view. My protest is really against the present method of letting the child choose its own food without thought of discipline or of the future, and of course the poor follow, when possible, the example of the rich in the matter of meat and eggs for the child.

DR. SMITH (Dr. Morse's paper): I should like to ask Dr. Morse whether he considers a positive D'Espine's sign below the seventh cervical vertebra, if it is the only abnormal sign present, if that alone is considered sufficient evidence of enlarged bronchial glands, or whether there must be with it some other evidence?

DR. MORSE (replying to Dr. Smith's question): I would consider that that was sufficient evidence to show that there was some tissue between the trachea and bronchi and vertebral column which ought not to be there. In all probability that tissue would be enlargement of the bronchial glands.

SYMPOSIUM ON POLIOMYELITIS.

A JOINT MEETING under the auspices of the Department of Public Health and Charities of Philadelphia, the Philadelphia County Medical Society, and the Philadelphia Pediatric Society, to discuss anterior poliomyelitis, was held on Thursday, July 13, 1916, at 8.30 P.M., at the College of Physicians of Philadelphia. DR. JOHN D. MCLEAN, President, Philadelphia County Medical Society, presiding.

SPINAL INFANTILE PARALYSIS.

DR. CHARLES K. MILLS. Experience with spinal infantile paralysis points to the fact that the disease is infectious or microbic in origin and tends to spread by at least two methods: through certain occult atmospheric or climatic influences, and by contagion. The healthy children of a family should be removed to other neighborhoods, while the sick are quarantined. Through the work of Flexner and others we know the measures which should be taken to prevent the spread of the disease by the secretions of the naso-pharynx and the intestinal excretions. Good nursing plays a large rôle in the treatment of infantile paralysis in all periods of the disease. Rest of body and mind is in the highest degree important. The virtue of a quiet and composed manner should be remembered by the nurse and enforced by the physician. Light and sound should be excluded during the acute febrile stage; also insect life. The method of handling the patient counts for much, especially in cases in which meningeal irritation or inflammation is prominent. The closest attention should be paid to keeping clean the nose and throat by gentle spraying with solutions of hydrogen peroxide or other germicidal solutions. Attention should also be paid to the intestinal excretions. With the appearance of paralysis and contractures, the limbs should be kept in positions less liable to lead to subsequent deformities. Massage should not be used until the fever has largely disappeared; at first, simply as gentle stroking, and later, moderate kneading combined with the stroking. The patient should not be lifted out of the bed, its position being changed in the bed instead. A typical case of the disease is easy of recognition within three or four days after the onset of fever. It should be suspected before the paresis or paralysis appears. The presence or absence of pain and hyperaesthesia may be of value in determining whether the lesion is closely limited to the spinal cord or higher regions of the neuraxis or whether meningeal implications are shown. The physician should not make the mistake of supposing he is dealing with simple meningitis or neuritis when the fundamental disorder is poliomyelitis. When poliomyelitis is rife in more or less distant communities, one of the most essential things to remember is the frequent existence of abortive and aberrant cases so atypical as to make their nature doubtful. Such cases are as much a source of danger to others as those in which the disease is full-fledged in its manifestations. As a neurologist my attention has been called in a striking manner to mistakes of diagnosis in severe cases of poliomyelitis, especially those showing bulbar, cerebellar or cerebral lesions. I have seen in consultation cases in which the diagnosis of brain tumor or meningitis has been made. I would emphasize, therefore, that during the prevalence of poliomyelitis, patients presenting cerebral, bulbar or cerebello-bulbar symptoms should be closely scrutinized with the idea that they may be cases of poliomyelitis of unusual localization. Unless the physician is aware that in the aberrant types the disease may attack practically any part of the brain or cord, he is likely to be misled in diagnosis. Instead of the physician being misled by abortive cases of mild type, exactly the opposite may occur and he may be confronted with febrile symptoms of the most severe character. In three such cases the condition was taken to be

cerebro-spinal meningitis, tumor or abscess; in two instances, typhoid fever of the cerebral type. Bearing in mind, therefore, the abortive form on the one hand and that of overwhelming severity on the other, the physician will be on guard concerning diagnosis, prognosis and treatment. The disease prevails epidemically in June, July, August and September. Whenever possible, children of an infected community, who presumably have not been infected, should be removed to locations supposedly immune; and, children should not at once be mixed with others who have been brought from a region where the disease had not existed. The manifest precaution is, whenever possible, to take great care in isolating children from a locality in which the disease is epidemic until the period of incubation is over, that is, after two or three weeks have elapsed.

ANTERIOR POLIOMYELITIS.

DR. JAMES H. MCKEE: As Dr. Mills has said, Philadelphia has splendid traditions in the treatment of epidemics. There is little that is characteristic about the onset of poliomyelitis; so very many of the symptoms simulate those of other infections and of some autointoxications. There is nothing very typical about sudden onset with moderate fever usually lasting for several days; nor is there anything very characteristic about the constitutional symptoms, or the fact that the attacks sometimes follow infectious disease. This is particularly true of the polio-encephalitis types. Yet we doubt not that the nervous symptomatology is suggestive in the presence of epidemics. It is not usual for babies and very young children to have severe pains in legs, arms, fingers and toes; headache and backache. This is also true of the tenderness which is often quite general and the rigidity of the neck. There are relatively few things in early life that cause such symptoms and signs. I need not say that we should seek light from the laboratory, where the results of blood and spinal fluid examinations are of undisputed value. One other symptom that is uncommon in infancy and early childhood and which so often leads to the diagnosis of "rheumatism" is that of profuse sweating. In the differential diagnosis we must consider scurvy, but that is a chronic affection with slow onset and definite history and is usually afebrile. Tonsillitis in early life may be accompanied by severe pains. In the various conditions to be considered differentially the laboratory comes to our aid. The appearance of the paralysis marks the place at which most of us should leave off with the patient and be prepared to accept a subsidiary rôle, leaving the major part of the treatment to the orthopedists who know much more about this stage than do we. In the prevention of the disease we must deal with prophylaxis in general. Since the disease occurs particularly during the hot months of the year, we should get the children out of the large cities. The patient should be segregated and much attention paid to the care of all discharges. Animals, although not infected, may be carriers, and should be excluded from the patient. Attendants should wear uniforms and probably rubber gloves. Cleansing of the nasopharynx is essential. The bowels should be opened freely; perhaps nothing is better than the old-time calomel followed by castor oil or salines or hot baths of mustard with as little disturbance of the patient as possible. Sweating is probably one of Nature's efforts to eliminate the toxins and we have felt that this should be increased as much as might be. In the presence of meningitis lumbar puncture seems wise to reduce pressure and lessen toxicity. Great emphasis should be laid upon the necessity of absolute rest and quiet for the patient. Protection of the paralyzed parts with cotton, wire frames, etc., needs only to be mentioned. Voluntary activity should be resumed very slowly. Hope for the recovery of the paralyzed part should obtain not only for a year, but for many years.

POLIOMYELITIS.

DR. PAUL A. LEWIS: Six years ago in this building, before the College of Physicians of Philadelphia, I gave a summary of what up to that time had been done in the study of poliomyelitis. This summary was given from the results in the laboratory of the work of Dr. Flexner and myself. Two years ago Dr. Flexner made a statement of what he had done with other associates in the mean time. Since then little progress has been made. I can in no way disagree with anything that has been mentioned by Dr. Mills or Dr. McKee. They covered the ground accurately so far as their statements went. Perhaps you have seen the article by Dr. Flexner in the *Public Ledger* of last Sunday in which he summarizes his experiences in the matter. While there are some little corrections or notes to be made to that publication, yet so far as the laboratory work goes, it contains the latest evidence. I shall try to recall briefly my own experience with the work and emphasize some points of our laboratory findings in this and in other infectious diseases with which a community may have to deal from time to time. Poliomyelitis, as all know, is understood to be an infectious disease and, in some greater or less degree, a contagious disease. Its cause is known; to the elect few who have had opportunity to work with the disease in the laboratory its cause may be said to be well known. Reports in current newspapers of the very recent discovery of the cause of poliomyelitis are, of course, out of date. The essential cause was discovered six years ago and became a matter of common knowledge to those who read the results of work in laboratories. Three years ago, with the actual cultivation of the organism by Flexner and Noguchi, the causal organism became more perfectly known. Six years ago inoculations were made from the spinal cord of the human dead of the disease into the monkey's brain and the disease was reproduced in characteristic fashion. From the infected monkey the disease was transferred through others to many hundred, and up to the present time the series has possibly reached hundreds of actual passages. It was found very shortly afterward that the infectious material from the central nervous system of the human could be passed through filters sufficiently small to remove the bacteria and that there would still be a fluid highly infectious. This established the fact that the micro-organisms were of well known bacteriological status, small enough to be passed through filters and difficult to see under the microscope. Some such may be bacterial in nature and can be cultivated as other bacteria are, and others are probably protozoa such as the virus of yellow fever and transmissible only through an intermediate host. The virus of poliomyelitis seems to be of the former class. It has been said that the organism is ultramicroscopic. It can be seen, however. The organism is so small that we cannot, however, tell anything about its structure, as is pos-

sible with the tubercle bacillus for example. We know the cause of poliomyelitis chiefly through Flexner and his co-workers, but their experiments have been confirmed and extended by others. Much has been said about the methods of transmission. I believe the studies have indicated to a certainty that transmission is by contact. On the other hand, there may be other methods of transmission. There are certain bizarre facts in connection with the disease not easily explained on the basis of direct contact. However, we cannot go astray in taking this assumption of contact as the starting-point of combating any epidemic that may arise. There is often difficulty in guarding against contact because many cases are abortive to the extent that the individual shows no signs which lead the family to call the physician and no sign which would lead the physician to be positive in his opinion whether the patient had been suffering from any infection, to say nothing about poliomyelitis. For a certain number of paralytic cases there are a number not paralytic, and these are just as dangerous to the uninfected as are the paralytic cases. Upon these practical matters I feel the fullest assurance that your Board of Health is fully equipped and has a spirit entirely adequate to deal with the matter when the time comes. Such a time in this city we hope may be far from us. We must recognize that the time may come when it will be necessary to exercise the utmost patience with what the health department may deem essential in the effort to combat such an epidemic. By the examination of the spinal fluid tuberculosis and meningitis can be excluded if the tubercle bacillus is found. The study of the epidemiology of the disease under certain conditions the laboratory can greatly help. The laboratory, however, has done its best work in showing that individuals in contact with the infected are frequently carriers of the disease. The laboratory has confirmed the clinical observation that there is a mild abortive or subparalytic form of the disease. Furthermore, the presence of the virus in the nasal secretions has been demonstrated. There is no doubt that healthy adults may carry the virus if they are in contact with the infected individual. I want to emphasize the fact that we are on the right track so far as the laboratory can show in any prophylactic measures which the department of health may think necessary, based upon the supposition of the contagiousness of the disease. The laboratory has produced nothing of practical importance in the therapeutic control of the disease, beyond the fact that certain experiments by Flexner and his co-workers show that the serum of immunized animals and some chemicals could under certain conditions mitigate the disease in monkeys. On the other hand, the fact that these workers have not shared their work with the public is sufficient evidence that they have not a cure for poliomyelitis. Anything the newspapers may say to the contrary should not excite anybody. In considering our ability as a city to cope with this disease we find that we have a good health department and a well educated medical public. That which we have not got, but which could be used to great advantage, is an available sum of money to be devoted to the study of infectious diseases.

INFANTILE PARALYSIS.

DR. J. TORRANCE RUGH: The treatment of the ravages of infantile paralysis devolves ultimately upon the orthopedic surgeon. There are, however, many things which the general practitioner should know regarding the care of these patients during and following the attack. The great essential in the after-treatment of these cases is absolute rest. You will be importuned by the family to allow the patient to sit up, or to move the affected leg or arm. Don't let it be moved; keep that part still, at absolute rest! The treatment as advocated by Oppenheim and elaborated by Lange of fixation in plaster of Paris to secure rest, essential for restoration of function and the carrying away of the products of the inflammation, has given by far the best results in these cases. The great trouble, however, is the difficulty in securing the coöperation of the family in allowing such fixation. Any treatment, so far as our experience goes, which is directed to the nerve centers themselves, has met with utter failure. Certain electro-therapeutists claim ability to restore to a very much greater degree the nerve function of these nerve centers than can be accomplished by any other means. But here enters the great problem to which Dr. Mills has already called attention,—that in all grades of infection from the abortive to the fulminating, no man living knows how far recovery of paralysis will take place without any aid whatsoever. Some of these cases which have been totally paralyzed, recover with apparently no evidence of the disease. Therefore, to ascribe to any one method of treatment curative effects so far as the nerve centers are concerned, is entirely out of the question. Our efforts must be directed chiefly to the care of the paralyzed parts. There is a too great tendency to begin the use of massage and electricity too early. These muscles must be put at complete rest until all evidence of the acute condition has subsided. Then the tonic treatment by massage, electricity, or whatever means, are employed, should be begun in the endeavor to maintain the tone of the muscles and the life of the muscle fibers. The muscles are kept at rest to guard against any strain which tends to increase degeneration of the fibers. There must be also the prevention of faulty postures. As a result of the acute inflammation in the structures faulty postures begin extremely early, even before they show themselves to the eye or the finger of the examining surgeon. If the paralysis affects the trunk muscles, the child should not be allowed to sit up. If the paralysis affects the legs, the patient should not be allowed to walk, as there is nothing to maintain the weight of the body except the ligaments and they are insufficient, unless supported by the muscles. Therefore, when the muscles are paralyzed the earliest thing to do is to keep the parts absolutely at rest; keep them from assuming a deformed position and guard them against strain. When the child begins to walk the extremities should be maintained in their proper position. It is surprising, in many instances, the great amount of power which will return after four or five years when these muscles which have been subjected to constant strain have been protected and the part maintained in proper position. If there is any tendency to deviation from the normal position a brace should be applied to the part. The indications for the application of braces are definite, whatever condition may be present and no brace should be applied, except to accomplish certain absolute needs. The therapeutics of a brace are as accurate as those of a drug. Another measure of value to be employed early is that of having the patient practise voluntary movement of those muscles which have

not been totally paralyzed. By giving the child voluntary control over a group of weakened muscles the opposing muscles will be prevented from drawing the part into a deformed position, and when the child walks he will be able to maintain the correct position. In those cases in which there is total loss of power, operation offers a great deal in treatment. This, however, brings in a portion of the work which belongs to the specialist, and any man who attempts work of this kind, unless he is trained to it, will meet with absolute defeat in the treatment of these cases. The surgical treatment of infantile paralysis is divided into the two great classes of destructive and constructive surgery. Constructive surgery is indicated after two years have elapsed since the attack of the paralysis, and consists chiefly in the transposition of tendons, silk inserts and similar measures. Destructive surgery, which aims at securing stability at the expense of certain structures or functions, should not be employed until six years have passed, and in the selection of operations those which utilize structures already existing are to be preferred to those which make use of foreign substances for various purposes.

DR. WILMER KRUSEN, Director of Public Health and Charities, Philadelphia: Of the two cases of reported infantile paralysis now in the Municipal Hospital, one is a case of true infantile paralysis; the other, a case of infantile paralysis, but not of the poliomyelitic type. We have found that the child's paralysis is due to a cerebral abscess following middle ear disease. We have, therefore, only one case of true infantile paralysis. You can readily understand that with such a severe epidemic in New York and Brooklyn, our work in connection with the department of health has been most aggressive. While we believe in preparation for a possible epidemic, we do not believe it wise to frighten either the public or the profession. We have wards available in the Municipal Hospital to take care of at least 100 cases. If necessary, it will be possible to have other general hospitals set aside certain space. I want to take this opportunity to thank the pediatrists, neurologists and orthopedists and all others who have given of their time and service in the last few weeks in assistance to the Department of Health. We have been trying to educate the family to send for the physician promptly when illness occurs among the children. We shall pursue in poliomyelitis the same stringent measures observed in cases of smallpox.

DR. JOHN F. SINCLAIR, President, Philadelphia Pediatric Society: I am glad that for the present the misfortune of an epidemic of infantile paralysis has not come to us. It seems imperative, however, that we should be alive to the questions connected with this disease and be prepared to meet it if we must. Personally, I want to thank those who have been so ready to coöperate, the many who have shown their interest in the subject by the large attendance at this meeting, the College of Physicians for giving us the use of this room, as well as the essayists of the evening.

DR. D. BRADEN KYLE laid emphasis upon the responsibility of the upper respiratory tract for the infection and spoke upon prophylaxis and treatment from this standpoint.

DR. CHARLES K. MILLS: We are not yet aware of the manner in which poliomyelitis is transferred from one geographical locality to another; we see it appearing in widely different sections with great intermediary regions free of the disease. In the migration of the contagion I think not enough attention has been paid to the part played by animals and to the birds of the air. The possibilities in this connection offer fascinating subjects for study.

Book Reviews.

Treatment of Infantile Paralysis. BY ROBERT W. LOVETT, M.D., Boston. Philadelphia, P. Blakiston's Son and Company, 1916.

There could hardly be a more opportune time for the appearance of this work by one of the leaders of American orthopedics than the present juncture, when anterior poliomyelitis is acutely epidemic in New York City and elsewhere in the United States. The great prevalence of the disease in this country since 1907 has led to its more intensive study here than in Europe, and it is to American internists, orthopedists, and laboratory workers that we are indebted for the greater part of our knowledge of its pathology and treatment. Naturally, Dr. Lovett is chiefly concerned with the treatment of the convalescent and chronic phases of the disease, and his chapters on these subjects represent the ripened surgical experience, based on the unusually extensive opportunity of observation which he has had. The earlier chapters, however, on the pathology, symptoms, types, epidemiology, diagnosis, and prognosis of poliomyelitis, and of the treatment of its acute phase, are likewise of extreme value and summarize in classic form the best of our present knowledge. The chapter on muscle training describes a series of valuable exercises designed for the reëducation of infantile paralytics, in which the author acknowledges the valuable contribution of his assistant, Miss Wilhelmine G. Wright. The closing chapter describes the employment of the spring balance muscle test devised by Dr. E. G. Martin, and first applied by him in 1915. Not only at the present time, but in the future, this monograph must be one of extreme interest and value to general practitioners, surgeons and medical students.

The Medical Clinics of Chicago. W. B. Saunders Co., Philadelphia, March, 1916.

The March number of the Medical Clinics contains a large variety of case reports by seven internists. The cases cover a wide range and there is much incidental valuable information brought out in the discussion. In this number is introduced an account of the further progress of a case reported in the first number. If this feature is continued and developed so as to give the actual end results of all the cases discussed it will greatly enhance the value of the clinics.

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PREVENTION AND TREATMENT OF POLIOMYELITIS.

THE epidemics of poliomyelitis of New York City and elsewhere continue apparently unabated. On August 10, the number of cases in New York City reached a total of 5822 with 1298 deaths. In New York State, outside of New York City, the total of cases on this date was 856 with 79 deaths. In Massachusetts the total number of cases since June 1 is 178, with 19 deaths. It is evident that the percentage mortality in this commonwealth has been considerably lower than that in New York.

Naturally, the prevention and the treatment of the disease are topics which receive primary attention. Rigorous quarantine regulations against New York City have been adopted by many of the surrounding states. In a recent weekly report of the U. S. Public Health Service is published the following standard set of reasonable quarantine regulations as drawn up originally by the Vermont State Board of Health and recommended for adoption elsewhere.

"1. No child under the age of 15 years shall reside in this state for a period of more than 24 hours without being reported by an attendant, parent or guardian, to the health officer of the town or city where such child is, provided such child has been in the City of Greater New York, since the 20th of June, 1916.

2. It shall be the duty of every housekeeper, manager or proprietor of every hotel or boarding house where such child is domiciled immediately to report such child, giving the name and age, to the health officer of his city or town.

3. Every such child shall be subjected to quarantine for a period of two weeks from the time such child was last in the City of Greater New York.

4. The Health Officer of every town and city to whom such a child is reported shall immediately serve a written notice upon the head of the family in which such child is. This written notice shall contain a copy of these regulations and an order signed by such health officer requiring such child to remain on the premises in which it is at that time for the specified time of two weeks after last leaving the City of Greater New York.

5. Each health officer to whom such a child is reported shall require of the attendant, parent, or guardian of such child a certificate in writing, duly signed by a legal practitioner of medicine, certifying that the nose and throat of such child has been thoroughly washed with a solution of a teaspoonful of common salt in a pint of water once a day for a period of three consecutive days before the premises are released from quarantine.

6. No child under 15 years of age shall enter any house so quarantined.

7. A placard containing the word 'quarantine' shall be sufficient evidence to all persons that the premises are quarantined for the purpose of these regulations.

Nothing in these regulations shall be construed to prevent other members of a household in which there is a child as above described, who has left the City of New York since June 20th, 1916, from attending to their usual occupations.

The owners, managers, or proprietors of hotels and boarding houses may place no restrictions on attendants or guests in their hotels or boarding houses further than the strict isolation of any children, as above described, from New York City, provided such children are isolated to the satisfaction of the local health officer, and their noses and throats irrigated as specified.

Each health officer will see that a copy of these regulations with which he is furnished is conspicuously displayed in at least three public places in his town or city.

These rules and regulations will remain in force until further notice."

Many medical journals are publishing special poliomyelitis numbers, and a large amount of literary material is thus being produced and accumulated on this subject. Various suggestions have been made with reference to the specific prevention of the disease in individuals. In this connection we would call particular attention to the suggestion made in an article by Dr. Whittemore in another column of this issue of the JOURNAL, and to other suggested preventive measures, described under the Miscellany column of our present issue. Naturally, the determination of the value of these suggestions must rest upon repeated and extensive experimental observations of their efficacy. Attention is also called to abstracts of current literature on poliomyelitis, to the Philadelphia Poliomyelitis Symposium, and to a review of Dr. Lovett's recently published monograph on the subject in other columns of this issue of the JOURNAL.

Numerous suggestions have also been made relative to the treatment of the disease. Most noteworthy among these is that of Dr. S. J. Meltzer of the Rockefeller Institute, who urges the use of intraspinal injections of adrenalin; and that of Dr. N. MacL. Whittaker of Brooklyn, who has reported beneficial results from the hypodermic injections of quinine and urea hydrochloride.

The conference of pathologists and internists which was held at the New York Academy of Medicine on August 3 and 4, resulted in the appointment of two subcommittees between which the work to be undertaken will be divided. The first committee, which is to consider all phases of laboratory investigation and to suggest subjects and lines of study in connection with poliomyelitis, consists of Dr. Simon Flexner of the Rockefeller Institute as chairman, and the following members: Professor Ludwig Hektoen, University of Chicago; Professor Hans Zinsser, College of Physicians and Surgeons; Professor R. M. Pearce, University of Pennsylvania; Professor J. W. Jobling, Vanderbilt University; Dr. G. W. McCoy, director of the hygienic laboratory at Washington, and Dr. Theobald Smith, Rockefeller Institute.

The other committee, which will consider practical measures that might apply in the suppression of the epidemic, is made up of Professor Victor C. Vaughan, University of Michigan, chairman; Professor M. J. Rosenau, Harvard; Dr. William H. Park, Department of Health; Dr. F. W. Peabody, Boston; Dr. John Howland, Johns Hopkins University; Dr. Augustus Wadsworth, director of the State Laboratories, and Professor C. C. Bass, Tulane University.

It was also announced on August 7, by Dr. Haven Emerson, New York Health Commissioner, that a committee of entomologists, connected with the U. S. Public Health Service, has been appointed to undertake an investigation of all forms of insect life to be observed in New York City and vicinity, with a view to determining what species, if any, can or may be carriers of poliomyelitis infection. The likelihood of insect transmission of disease has of late been largely discredited. The work of Rosenau in 1912 remains uncontroverted, however, and the possibility of this mode of infection should still be seriously considered. The etiology is rendered fairly certain by the work of Flexner, and seems without reasonable doubt to be represented by the minute coccus-like organisms which he originally observed and described.

The seriousness of the present epidemics seems rather to increase than diminish. The prevalence of poliomyelitis is by far the most important outstanding medical phenomenon in the United States today. Doubtless the disease will, in time, run its course like all self limited epidemics. Meanwhile everything known to science that can be done to check its extension is being carried out. It is the relative limitation of our knowledge with regard to the disease, and our lack of specific methods of prevention and cure, which lessen our present control of its spread, and make the subjects of prevention and treatment the most important present aspects of the situation.

TWO PHYSICIANS OF A FORMER GENERATION.

IN the issue of the JOURNAL for April 22, 1915 (Vol. clxxii, p. 603) we commented editorially on the life and on the editorial and medical writings of Dr. William Wallace Morland, an early editor of the JOURNAL, basing our comment on material contributed by a correspondent. This same correspondent has recently sent to the JOURNAL some hitherto unpublished verses addressed by Dr. Morland to his classmate, William Thornton Parker.

Dr. Morland received the degree of A.B. from Dartmouth in 1838, and he and his

classmate, Parker, who was evidently his intimate companion and friend, entered the Harvard Medical School together, and both received from it the degree of M.D. in 1841. Dr. Parker died on March 12, 1855, the year in which Dr. Morland first became associated with the JOURNAL as assistant to the editor, Dr. J. V. C. Smith. Dr. Parker's obituary was published in the issue of the JOURNAL for March 22, 1855 (Vol. lii, p. 144). Though there is no positive evidence on the subject, it seems probable that it was written by Dr. Morland. The following extract affords interesting testimony, not only to Dr. Parker's qualities of character and mind, but to the esteem in which he was held by his lifelong friend:

"By the death of Dr. Parker, both the profession and the community have sustained a real loss. To eminent professional abilities, he added that sound judgment, highly honorable feeling and exceeding kindness of heart, which, united, constitute the truly 'good physician.' From early and most intimate acquaintance with him we feel that we can speak with confidence of his attainments, his exertions for usefulness, his qualities of heart and mind. For many years 'we have been friends together,' and the sadness which the departure of a valued associate brings with it is mingled with an unusual amount of very grateful and pleasant reminiscence. Active and industrious in his habits, Dr. Parker established an extensive practice for himself, in South Boston, immediately after taking his medical degree. There are many in that portion of our city who can testify to his unflinching integrity, his entire devotion to the interests of those entrusted to his medical care, his acute discrimination of disease, and his faithfulness, to the very last of his career, as a practitioner. To this trait, indeed, is much of his ill health, latterly, to be ascribed. Overwork did a vast deal towards developing the slow but sure disease of which he died. Unwilling to yield, he struggled on, visiting his patients continuously, often leaving his bed for several successive nights when ill able so to do. Compelled at last to quit an excellent practice and to resign the home-comforts his industry had gathered, he sought health both in Cuba and by a residence of some months in Europe, but without avail. With a strong will and a large share of the good spirits which once animated him, he toiled almost to the last day of his life, to supply the failure of the means formerly afforded by his professional exertions. Occupation was his life. He never seemed unhappy when employed. Pleasantly retired in a beautiful neighboring town, he wrought with pen and pencil, amid much physical trial, but surrounded with warm friends and delightful influences. To most of his medical brethren here, his skill as an artist is well known. We do not know, in the ranks of the profession, any one who at all approached him in the art of delineation and design. In pencil drawing he was an adept; in coloring, his hand was unrivalled. We have seen his copies from the most splendid anatomical plates, which we literally prefer to the original. In sketching, as well as in copying, he was peculiarly felicitous. One of ths most touching circumstances connected with our remarks upon this accomplishment is the fact that the *last* work done by his hand was executed for the writer of this slight tribute to his worth. These drawings, finished only a few days before his death, have a value that can attach to such works alone. He who would so use the pencil might find in it almost a support. By a medical man, especially in these days of minute investigation, the talent cannot be too highly estimated.

"Constantly occupied through the past winter, and enjoying much of that social comfort which was ever grateful to him, he has at last gently passed from earth, solaced by the consolations and hopes of religion. Violent hemorrhage from the lungs was the final agent in the gradual process of dissolution."

The following lines, to which we have previously alluded, further represent in verse Dr. Morland's feeling for his friend and afford evidence, likewise, of his literary ability in metrical composition:

TO MY CLASSMATE

WILLIAM THORNTON PARKER (A.M., M.D.)

July, 1838.

There is a word, alas how often spoken,
A startling word
Telling of tender ties that must be broken
When it is heard:
Farewell! Oh whether in life's early morn
Or closing day,
Some friends asunder by that breath are torn;
How hard it is to say!
And why is it so hard?—we surely know
That here below,
Life's golden current cannot smoothly flow,
That thorns will grow
Upon the rose that woos our eager grasp,
And chilly grow
The hands once joined in fervent clasp,
Oh, this we know!
I could bid *thee* farewell—and if again
We meet,—
Grant heaven it may not be with stifled pain
To greet,—
I wish not that a change should darkly fall
Upon our youth,
That cold Deceit with her enshrouding pall
Bury Love's truth.
Oh, this can never change the low-breathed tone
Saying farewell!
It hath a moving power all its own
Its tale to tell.
The tongue may falter, but the speaking eye
How eloquent!

While freshly glow the tints in memory's sky
With future bodings blent.
Once more, my friend, farewell!—now all is bright
Our path around.
May fortune kindly for thee ever light
Her torch:—and bound
About thy brow be Fame's well-chosen wreath;
And when all thickly comes thy laboring breath,
And droops thine eye,
May Hope with lifted finger point above,
And show thy seat amid the throngs that love
To die
Such death as makes the Christian's cheerful tongue
In tones triumphant on the death-air flung,
Bid *earth* farewell!

MEDICAL NOTES.

Chemists and Technical Men to Meet in New York.—Official announcement of the meeting of the American Chemical Society, to be held in New York September 25 to 30, in conjunction with the Second National Exposition of Chemical Industries, was issued to the members by Dr. Charles L. Parsons, secretary, on August 15. Dr. Charles H. Herty, of the University of North Carolina, president of the American Chemical Society, will open the exposition on Monday, September 25, at 2 o'clock in the afternoon, with an address reviewing the history of chemistry and the chemical industries in this country, and outlining developments since the outbreak of war in Europe. The presidents of coöperating societies, such as the American Electrochemical Society, the American Institute of Mining Engineers, and the American Paper and Pulp Association, will follow Dr. Herty with speeches of welcome and reviewing the progress made in the industries represented by them.

The first general session of the American Chemical Society will open at Columbia University on Tuesday morning, September 26, and arrangements are being perfected for a public meeting in the large hall of the College of the City of New York on Tuesday afternoon, when addresses will be made of general public interest pertaining to the interesting developments in the field of applied chemistry during recent years.

The program of the week's meetings will provide for general conferences on subjects in which the chemists of the country are now interested, and it is intended that the lecture hall of the Grand Central Palace and Rumford Hall in the Chemists' Club building will be occupied each afternoon at the same time by one or other of the different divisions of the society for the discussion of such industrial topics as the production of dyestuffs, medicinal chemicals, industrial alcohol, the manufacture of paper pulp and by-products, oils and motor fuels, glassware and porcelain, steel alloy metals, new developments in chemical industries, etc.

On Wednesday and Thursday mornings a general symposium on colloids will be held, theoretical considerations being discussed on the first day and the industrial applications of colloid chemistry on the second day.

The American Electrochemical Society has planned a series of interesting meetings. The electrochemical group will open its meeting later in the week, on Thursday, September 28, with a technical session devoted to a review of American progress in the electrochemical industry. A complimentary smoker will be held on Thursday evening, and on Friday evening there will be a joint banquet at the Waldorf-Astoria of the members of the American Chemical Society, the American Electrochemical Society, and the Technical Association of the Pulp and Paper Industry.

EUROPEAN WAR NOTES.

Shipment of Red Cross Supplies to Germany.—It may be recalled that during the past winter, as noted in the Journal at the time, the British Government refused to permit hospital supplies to be sent from the United States to the Central European Powers, on the ground that there was no American Red Cross body in those countries to receive and use them. In reply to this action, former President Taft, chairman of the central committee of the American Red Cross, wrote, on May 8, to the United States Secretary of State, commenting as follows on the British proposition to admit no medical stores into hostile countries except for use by an American medical or hospital unit.

"This exception amounts to no concession, for the reason that, as the British Government was advised in August last, after the first of October, for lack of funds, we were able to maintain no hospital units in any of the belligerent countries. The authorities of the American Red Cross believe that under the Geneva Convention, to which the United States and all the belligerent powers are signatories, the United States has the treaty right to insist that articles serving exclusively to aid the sick and wounded in the form of hospital supplies, shipped by the American Red Cross to the Red Cross of the Central Powers, shall not be declared contraband, but shall be allowed safe conduct to their destination."

Again on June 10, Mr. Taft wrote as follows to the Secretary of State, making as a counter proposal, the suggestion that a commission be appointed to supervise the handling of American Red Cross supplies for the Central Powers.

"Replying to the letter from your Department of June 2d, relative to the question of the shipment of Red Cross supplies to the Central Powers, which was in answer to my letters of May 8th and May 27th, I beg to add the following:

"In a communication, dated March 27th, from the British Foreign Office, which was transmitted by your Department to the American Red Cross, occurred the following paragraph:

"'Your Excellency will be aware from my note of the twenty-second instant that His Majesty's Government have felt obliged to withdraw the lists of articles which they previously put forward as coming within the meaning of the provisions of the declarations of London regarding articles serving exclusively to aid the sick and wounded. His Majesty's Government have recognized one general exception to the restrictions imposed on the importation of medical stores into enemy countries, namely, that any supplies sent by the American Red Cross to an American medical or hospital unit in an enemy country will be allowed to pass freely into that country so far as His Majesty's Government are concerned.'

"In commenting on this in my letter of May 8th to you I said:

"'Through your Department we are now in receipt of a communication from the British Government, announcing that it does not intend to permit any further shipment, unless it is a shipment to our own hospital units, in a territory of the Central Powers. This exception amounts to no concession, for the reason that, as the British Government was advised in August last, after the first of October, for lack of funds, we were able to maintain no hospital units in any of the belligerent countries.'

"As a possible solution to the difference which now exists in our view of the obligation of the British Government under the Geneva Convention and its announced policy in limiting the permits for shipments of medical supplies to the Red Cross hospital units in the territory of the Central Powers, I beg to suggest, on behalf of the American Red Cross, that while we have no further funds with which to maintain medical or hospital units in the territory of the Central Powers, we should be able to send over a commission of satisfactory persons to receive our shipments and to superintend their distribution to hospitals and to supervise their use. This commission would be composed of persons for whose good faith the Red Cross would vouch in seeing to it that the supplies were devoted to hospital purposes only and to the relief of the sick and wounded.

"The Red Cross would be glad to submit the names of the persons constituting such commission to His Majesty's Government before appointing them. We have been very hopeful that the British Government would change its view as expressed in the correspondence already referred to, but if it maintains its position, we venture to make this proposal as a counter proposition, with the hope that you will submit it to the British Government on receipt of their reply to our letter of May 8th, which, as you say in your last communication, you have already forwarded."

The following is the reply to this letter under date of July 12, by Sir Edward Grey, Secretary of State for foreign affairs of Great Britain.

"I have the honor to acknowledge receipt of Your Excellency's note of the twenty-second ultimo regarding the proposal put forward by the American Red Cross with a view to facilitate the shipment of Red Cross supplies from the United States to the Central Powers.

"I have carefully considered this proposal, but I am at a loss to understand the suggestion made by the American Red Cross and quoted in Your Excellency's note that the policy pursued by His Majesty's Government is contrary to the provisions of the Geneva Convention. His Majesty's Government have in fact always taken the most scrupulous care to observe the provisions of this Convention, and they cannot appreciate how the present subject at all falls within its scope. In this connection Your Excellency may be interested to read the annexed statement published in the New York *Times* on the 12th May last, which sets forth the views of the French Government on the claims of the American Red Cross.

"His Majesty's Government have no reason to believe that there is an absolute lack in the territory of the Central Powers of the materials required for Red Cross supplies; they have, on the contrary every reason to suppose the reverse for, to give only one instance, not long ago a medical member of the Austrian general staff, Professor Hochenegg, wrote to ——, stating that there was no shortage and no prospect of shortage in medicines or bandages, nor even in highly special medical remedies, so that Austria was hardly concerned in the success of the protest made by the American Red Cross against the obstacles placed by the Allies in the way of the export of such articles from America. In these circumstances it is evident that if any deficiencies in these supplies exist, as to which there appears to be no evidence, it must be due to the fact that the Central Powers prefer to use the materials for other purposes, and any steps that may be taken to give them further supplies would conduce, not to the increased welfare of the sick and wounded, but merely to set free larger quantities of such materials for belligerent purposes.

"His Majesty's Government do not, therefore, feel able to create such an entirely new precedent as would be constituted by the supervisory commission suggested by the American Red Cross."

As a matter of fact, there is now a Red Cross unit in Germany and it remains to be seen whether, in view of this, Great Britain will now permit the shipment of surgical supplies for its

use. In any event, it is hard to see how, as is hinted in the quotation above, medical and surgical materials could be diverted to belligerent purposes.

Finally, on Aug. 1, the following memorandum, apparently intended to close the incident, was received from Viscount, formerly Sir Edward, Grey:—

"The position of the Allied Governments in regard to the importation of medical supplies into enemy countries is that they cannot be called upon to admit a practice which has been forbidden in the case of every blockade established in the past. They consider, moreover, that the Geneva convention obviously does not apply. These principles having been settled, frequent appeals have been made to the Allied Governments to make some concessions as a matter of grace.

"One suggestion is that a neutral commission should be appointed in Germany to receive imported medical supplies and distribute them to enemy hospital organizations, but this suggestion offers no means of restricting in any way the amount of supplies imported. To meet this objection it has frequently been suggested that the Allied Governments should specify the kinds and amounts of medical supplies, the importation of which into enemy countries they will be prepared to allow. But it is impossible to fix amounts in this way. One cannot ration the whole population of Germany and Austria in drugs and bandages. No ingenuity could estimate what might reasonably be needed by the population; it is equally difficult to lay down the kind of goods which may be allowed.

"His Majesty's Government have given close consideration to the question, and they have found themselves utterly unable to evolve any system by which the general shipments of medical supplies, once permitted, could be kept within the limits at all. Their reasons for not allowing unlimited supplies to go in have been frequently stated, viz: that the material sent in would replace materials existing in enemy countries, which could, and undoubtedly would, then be applied to other, and in many cases belligerent, purposes.

"His Majesty's Government on their part have, therefore, laid down the only workable distinction they could think of, namely, that American Red Cross supplies may be sent to American Red Cross units, wherever they may be. They feel that no juster test could probably be found of the strength of humanitarian claims and the interest taken by the people of the United States in needs of the Central Empires, than the extent to which the people of the United States are prepared to subscribe money or send doctors and nurses for hospital work in Germany and Austria. Wherever the sympathies and energy of Americans are manifested by the presence of the Americans engaged in the relief of suffering, there American supplies can be freely imported and used. This is a very definite concession and opens a wide door to American philanthropy, and His Majesty's Government cannot understand why, if feeling in the United States is strong on this subject, this door should be allowed to remain closed."

WAR RELIEF FUNDS.—On Aug. 12 the totals of the principal New England relief funds for the European War reached the following amounts:

French Wounded Fund.....	$110,956.67
Serbian Fund.....	102,348.07
Army Huts Fund.....	74,351.60
German Fund.....	63,339.41
French Orphanage Fund...	59,377.38
Surgical Dressings Fund....	42,996.87
Italian Fund.....	21,640.54
Allies' Tobacco Fund.....	1,610.00

MEXICAN NOTES.

RED CROSS NURSING SERVICE.—The following announcement was authorized on Aug. 1, by former President Taft, Chairman of the Central Committee of the American Red Cross:

Under the most efficient management of Miss Jane A. Delano, Chairman of the National Committee on Nursing Service, a corps of over 7000 of the representative graduate trained nurses of the country have been enrolled for Red Cross service. This branch of the work has become so large and important and the burden of it so great that Miss Delano felt it advisable to secure a superintendent for the Nursing Bureau, to be, if possible, one of the ablest training school superintendents. The Executive Committee concurred in Miss Delano's recommendation and we are fortunate to secure for this important office Miss Clara D. Noyes, Superintendent of the Bellevue Training School of New York City, who will take up her duties with the Red Cross on or about October 1.

The appointment of Miss Noyes in no way changes the general policy of the nursing service. Miss Delano maintains her position as Chairman of the National Committee on Nursing Service, and will continue to give her invaluable assistance to the Red Cross. Thanks to her devotion, and that of many of our chief nurses who have given up their vacations to this work, more than 1000 are ready for our base hospital units alone. A large number of smaller groups, consisting of 10 nurses each, and known as "Emergency Detachments of Nurses," are also being organized to meet any possible need of the Army and Navy.

THE RED CROSS AND THE UNITED STATES ARMY.—In the issue of the *Military Surgeon* for May, 1916, is an article by Colonel J. R. Kean on the relation of the Red Cross to the United States Army Medical Corps. It is a well known fact that in the event of war the Army

Medical Corps as at present organized would be entirely inadequate for the care of the wounded except in the first zone, which consists of the first aid stations directly behind the trenches, the field hospitals and the evacuation or clearing hospitals.

"The second zone, of communications and base, employs two kinds of units—field columns, which are transporting agencies; and base hospitals, which receive and give adequate medical and surgical service to the sick and wounded. This service in our country has never been organized until war begins; and the hospital service provided has been, therefore, at the beginning of our wars inevitably deficient, untrained and unsatisfactory, and a vast amount of unnecessary suffering and loss of valuable lives has been the result.

"The third service receives the wounded and sick who are transferred from the base hospitals as they become overcrowded; and also the convalescents who are able to travel but require further medical treatment before their return to the colors. This zone includes the army general hospitals and the great civil hospitals of the country which, under arrangements with the medical department, receive and treat the sick. The French are said to have about 4000 of these hospitals, containing 600,000 beds.

"The medical service of the Army is, therefore, like a bridge of three spans, of which the first span is completed and ready for work, and the third span can be rapidly completed because the framework is already in existence. The middle span of the bridge is, however, lacking; and it is believed that the Red Cross should be the organizing agency which will complete this middle span so that the bridge will be ready for use promptly on the outbreak of war. The Red Cross fulfills this function in the Italian and Japanese services, and, to a great extent, in the German, Austro-Hungarian and other European services. It is evident that by taking up this work of organization the Red Cross will perform a public service of the highest magnitude and importance to the nation and will have in the most effective way conceivable contributed to relieve the suffering of the sick and wounded."

MEXICAN RELIEF FUNDS.—On Aug. 12 the totals of the principal Massachusetts relief funds for troops at the Mexican frontier reached the following amounts:

Base Hospital Fund.....	$80,489.25
Home Relief Fund.....	2,633.00

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending August 5, 1916, there were 202 deaths reported, with a rate of 13.85 per 1000 population, as compared with 190 and a rate of 13.24 for the corresponding week of last year. There were 41 deaths under 1 year, as compared with 40 last year, and 46 deaths over 60 years of age, against 43 last year.

During the week the number of cases of principal reportable diseases were: diphtheria, 19; scarlet fever, 11; measles, 55; tuberculosis, 48; whooping cough, 30; typhoid fever, 2.

Included in the above were the following cases of non-residents: diphtheria, 3; tuberculosis, 2; scarlet fever, 4.

Total deaths from these diseases were: diphtheria, 3; measles, 3; pulmonary tuberculosis, 22; whooping cough, 2.

Included in the above were the following deaths of non-residents: diphtheria, 1; tuberculosis, 3.

Miscellany.

FRAUDULENT INFANTILE PARALYSIS "CURES."

OFFICIALS of the Department of Agriculture, charged with the enforcement of the Food and Drugs Act, expect that the outbreak of infantile paralysis will tempt unscrupulous persons to offer for sale so-called "cures" or remedies for this dread malady. They therefore have issued special instructions to the Food and Drugs Inspectors to be particularly alert for interstate shipments or importations of medicines, the makers of which allege that they will cure or alleviate this disease, for which, at the present time, no medicinal cure is known. The officials also warn the public that any preparation put on the market and offered for sale as being effective for the treatment of infantile paralysis should be looked upon with extreme suspicion. Inspectors, accordingly, have been instructed to regard as suspicious, and to collect samples of all medicines in interstate commerce for which such claims are made. Makers of such fraudulent remedies will be vigorously prosecuted whenever the evidence warrants action under the Sherley Amendment to the Food and Drugs Act. So-called remedies for infantile paralysis which are offered for import into the country will be denied entry.

The Food and Drugs officials are particularly watchful in this instance because it has been noted in the past that whenever a serious epidemic exists, unscrupulous dealers prey upon the fear or ignorance of the public by flooding the market with worthless, hastily prepared concoctions, for which they assert curative properties, which have no foundation whatever in fact. In the present instance, inspectors already have discovered shipments of a few such mixtures.

The Department will do everything it can under Federal law to protect that portion of the public which is extremely credulous in times

of panic, and which will grasp at anything which promises protection or relief. The sale of such products at this time, the officials point out, is particularly threatening to the public health because many persons, relying on the false statements of impostors, neglect to secure competent medical advice. As a result, not only is the safety of the patient endangered, but in the absence of proper sanitary precautions, the likelihood of contagion is greatly increased.

It must be understood, however, that the Federal Food and Drugs Act applies only to products which are shipped in interstate commerce, that is, from one State to another, or which are offered for import or export, or which are manufactured or sold within a territory or the District of Columbia. Products which are made and consumed wholly within a single State are subject only to such State laws as may apply and are under the control only of State health officials. The Federal law does not apply, for instance, to patent medicines made within the State of New York and sold in New York City. Persons buying or using a "remedy" made in their own State, therefore, must rely on the protection accorded them by their local health authorities.

PREVENTION OF POLIOMYELITIS.

THE United States Public Health Service has recently issued the following statement relative to the prevention of infantile paralysis:

"To control the present epidemic of poliomyelitis the chain of infection between persons harboring germs of the disease and the well members of the community should be broken. Infantile paralysis is probably caused by a very minute organism found in the nasal, mouth and bowel discharges of those who have the disease, or who are carriers of the germ without themselves suffering from the ailment. All of the steps in the spread of the infection are not known, but if this germ can be prevented from passing from the infected to the well person, the disease will cease.

"Infantile paralysis is not a disease of recent origin. Sporadic or scattered cases have occurred throughout the country for many years, but it is only during the last decade that the infection has assumed epidemic proportions in the United States. The present epidemic in New York City, on account of its magnitude and virulence, has awakened the residents of many communities to the danger of the importation of the disease into their own midst. This danger is real, but if due precautions are exercised it is believed that the epidemic will subside.

"The actual control of the present epidemic must be left to the City, State and Federal health authorities. These organizations will properly quarantine and care for affected persons, prescribe sanitary measures, and limit as may be necessary the travel of individuals in order to protect neighboring districts from the infection. Individuals and communities, however, can do much toward their own protection.

"Poliomyelitis is probably spread, directly or indirectly, through the medium of infective secretions. Account must, therefore, be taken by communities of every means by which such secretions are disseminated. Promiscuous expectoration should be controlled. The common drinking cup affords a method for the interchange of material of this nature, and should, therefore, be abolished. Rigid cleanliness of glasses and utensils at soda fountains, in saloons and other public places, should be enforced. Flies, roaches and other vermin, by coming in contact with infective secretions, may possibly convey them to our food, and thus directly bring about the development of disease. Therefore eliminate insects. Street and house dust bear a definite relation to the spread of many infections, and it is not unreasonable to presume that they may be a factor in the dissemination of infantile paralysis. Maintain strict cleanliness of streets, yards and alleys in order to prevent the breeding of insects and other vermin. See that all garbage and waste are properly cared for and collected at regular and frequent intervals. Guard all food supplies, especially milk and other perishable products. Digestive troubles of children arising from the ingestion of food of questionable quality may lower resistance. Assemblies of children in infected localities are to be discouraged, if not actually forbidden. While the above measures are in a sense general, and applicable to many epidemic diseases, their importance should not be overlooked:

"Individual preventive measures may be thus summarized:

"Summon a physician at once and immediately notify the health officer of the presence of the disease. If the disease is present in the community, medical aid should be sought whenever a child is sick, no matter how light the illness; many cases of infantile paralysis begin with a slight indisposition. Should the illness prove to be infantile paralysis, isolate the patient, place a competent person in charge, and reduce all communication with the sick-room to a minimum. Hospital care is preferable, not only for the child, but in order better to safeguard against the spread of the disease. The sick-room should be well ventilated and screened. Nasal and mouth secretions should be received in cloths, placed in a paper bag and burned. The clothing of the child, the bed linen, and the excretions should be disinfected in the same manner as for typhoid fever, that is, by boiling, the long continued application of 5% carbolic, or other well-recognized disinfectant. The same is true for dishes and drinking vessels. Nurses should exercise the

same precautions as regards cleanliness of hands in caring for infantile paralysis patients as for those afflicted with other infectious diseases.

"A child may convey the disease to others, even after a lapse of several weeks. For this reason quarantine should be maintained for a considerable period, usually from six to eight weeks, and the above precautions should be adhered to during this time. Disinfection of the room following recovery is advisable."

Correspondence.

BRITISH MILITARY ORTHOPEDIC HOSPITALS.

(From Our Special Foreign Correspondent.)

LONDON, ENG., July 15, 1916.

Mr. Editor: We have passed a very interesting day in some of the Orthopedic Centres for the British forces. Thanks to the kindness of Colonel Robert Jones, we were conducted through Hammersmith Military Hospital in the morning. At the outbreak of the war the buildings now occupied by the hospital were poor house and infirmary to the surrounding district, but their equipment and size were such that the group was usually known as the "Paupers' Palace."

Patients are chosen from the various Military Base Hospitals and sent here that they may be attended by orthopedic specialists. A very interesting clinic was held and some excellent results shown, such as the efficacy of various splints to improve deformed limbs. The hospital includes a complete little gymnasium equipped with simple apparatus for the use of the convalescents. Even in some of the wards we found apparatus, such as a ladder for climbing and wheels whose resistance might be measured and controlled. With these machines and many others every opportunity is given the men to strengthen their weakened limbs. There is a large corps of masseuses and also a department for exercise by electric stimulation, which was most interesting. We entered a large room equipped with about 12 beds. At each bedside sat a girl whose work it was to stimulate various motor points in the patient's muscles under the direction of the doctor in charge.

The apparatus used was not complicated. It consisted of an inductorium whose secondary coil was short and composed of thick wire. The make and break rhythm was slow. The larger of the two electrodes was led off to some convenient spot, as the back of the patient's neck or posterior aspect of the thigh. The smaller round electrode was held in the operator's left palm so that she could feel the extent of any muscular contraction caused. In her right hand she held a soft iron core which she passed in and out of the coil. The entrance of the core served to increase the current in the secondary circuit sufficiently to cause contraction of a muscle or group of muscles and the strength of stimulus could be graduated by the varying amount of core entering the coil. The doctor in charge believed the good results he was obtaining were due to the fact that he never tired the muscles out, beginning with a very brief exercise which he daily increased, and also to the fact that the rhythm of stimuli used was uniform. He demonstrated how easily he could stimulate the vastus internus which was not brought into play by simple voluntary extension of the knee joint. With the exception of ionization he made no further use of electric currents. We passed on to see an exhibit of water color paintings. Colonel Jones had chosen, as subjects, various limb deformities resulting from wounds of long standing. The artist was a man of very considerable reputation, who was "doing his bit" in this way. Form and color were accurately reproduced and the collection will undoubtedly be of great value. A record of the most instructive deformities was being kept in plaster as well as on canvas. One room contained a well done set of plaster casts in which the maker took a just pride. Some of the casts had been made before treatment and some afterwards, while the nature of the treatment was indicated in each case so that the demonstration was most instructive.

To supplement the morning spent in Hammersmith Hospital, we paid a visit to Queen Mary's Auxiliary Hospital at Roehampton Lane. It is run by the above auxiliary with the coöperation of the medical departments of the army and navy. The unsatisfactory nature of artificial limbs which were being supplied to maimed soldiers and sailors became apparent early in the war, so that on July 20, 1915, a demonstration of artificial limbs, open to manufacturers of all nationalities was held at Roehampton House. Twenty-four different firms took part in this contest. The Directors-General of the Army and Navy Medical Services and the president of the College of Surgeons, England, with the assistance of British and Irish surgeons, acted as judges. Several American firms made very creditable showings and were given exclusive contracts for the production of artificial limbs used in connection with the work of Roehampton House. This institution undertook all such military work for the Kingdom with the assistance of a smaller hospital at Alder Hey, near Liverpool. In October last, there was a waiting list of 800 cripples. Today there is no waiting list unless it be of those in the 570 beds at Roehampton. They accept only those patients who are ready for artificial limbs, and keep them until a satisfactory degree of efficiency has been obtained with the new member. As an aid in this process and that the men may lose no time, work shops have been established on the hospital grounds. Here daily classes are held in stenography, lathework, woodwork, electrical fitting and automobile repair. An employment bureau undertakes to secure work for the outgoing patients, or they may go on learning their newly acquired trade in any of the larger cities of Great Britain free of charge. That is, they may enter one of the polytechnic training schools which have been established at various centres. All of the orderlies and attendants about the hospital are old patients, who constantly demonstrate to the incomers that usefulness has not gone with the loss of arm or leg.

As we entered the assembly room, the daily examination was in progress. A dozen men, wearing artificial arms, were standing in a row and each in turn demonstrated to the surgeons his proficiency with the new member. It was surprising to behold the exactness of their movements. One man, who had lost his arm at the middle of the humerus, used his good hand to close the artificial fingers about a pen and wrote his name quite legibly with the new arm. He then removed the hand at the wrist and replaced it by a fork. This he guided accurately to his mouth. Movement of the arm upward and across the chest caused simultaneous flexion of the elbow joint. Each case was considered in turn, and either passed, or the limb maker was requested to try again. A line of twenty men with artificial legs entered and each marched in turn past the surgeons. As we left the "House" and walked down the drive, the grounds were filled with cripples who hobbled about in their blue flannel suits. All that science could offer was being done for them but they were, at best, a pitiful little army of makeshift men.

Sincerely yours,

W. G. P.